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AUTOMOTIVE INDUSTRIES

January 4, 1936

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Used-Car Stocks Increased 50%

Survey of Dealers in 25 Cities Shows Average of 60 Days' Supply on Hand

The increasing gravity of the used car problem in the United States is emphasized further by the results of AUTOMOTIVE INDUSTRIES' poll of dealers in 25 leading cities strategically located throughout the country. Tabulation of the returns indicate used car stocks have risen generally about 50 per cent for the nation. The lowest increase reported was 20 per cent and this ranged upward in varying degrees to a high of 300 per cent. As indicated in the report of this survey in our Dec. 28 issue, the sharpest rise materialized about Nov. 1 with the introduction of 1936 models.

To determine the actual status of used car stocks, market conditions, sup-

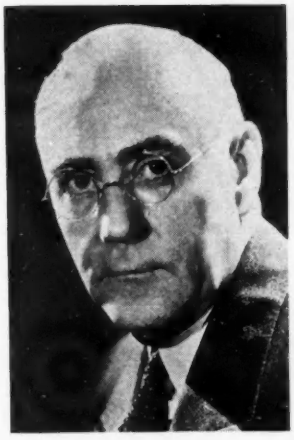
(*Turn to page* 8, *please*)

Hupp Shuts Down While New Capital Is Sought

For lack of working capital, Hupp Motor Car Corp. failed to resume operations following the holiday closing on Dec. 20. Directors authorized suspension of production until new money could be raised, and directed that application be made to the Federal Reserve Bank for a loan of $1,000,000. Consideration also is being given to a plan for raising funds by sale of 200,000 shores of treasury stock to present stockholders. The company still has a substantial number of orders on its books which cannot be filled until working capital is provided. Only a skeleton organization is maintained at the plant, and the office staff has been cut to less than one-third.

Chrysler British Damage Case Settled Out of Court

The appeal made by Chysler Motors officials against damages of £39,500 awarded by a British court a few weeks ago has been withdrawn, according to press dispatches. The defendants in the case were, besides Walter P. Chrysler, his associates, Bernard E. Hutchinson, Joseph Fields, and Stephen D. Briggs, as well as the Chrysler Corp. itself. A settlement was made out of court, according to the attorneys of both parties, who refused to reveal details of the agreement.



M. E. Coyle

Coyle Celebrates 24th Anniversary With GM

M. E. Coyle, president and general manager of the Chevrolet Motor Co., began his 25th year with the company last week. Reminiscing, Mr. Coyle said: "It doesn't seem like it was very long ago, if it is viewed only on the surface, but actually the trail leads over a lot of hills and valleys, especially in the automobile industry. Today that industry is so much better developed —the result of experience and skill that came as it made progress—that it seems to bear little relationship to the young business in 1911."

Auto-Lite Division to Syracuse

Operations of the arc welding division of the Electric Auto-Lite Co. are being transferred from Niagara Falls to Syracuse, N. Y., it has been announced by Royce G. Martin, president.

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Output Slightly Below Last Month

Production Will Not Equal Retail Demand Until Late in Month

By HAROLD E. GRONSETH

The motor industry went into the new year with production in high gear, and with unfilled orders still on its books after a record year-end output in the final two months of 1935. Not until late in January is production expected to be fully caught up with retail demand, although that condition already has been reached by some manufacturers.

The first month of the new year will find operations maintained at a pace only slightly below that of December, with the prospect that output of cars and trucks will exceed that of any January, except for the peak year, 1929. Schedules for the month have not been definitely established, but on

(*Turn to page* 8, *please*)

"$25-a-Month" Finance Plan Launched by Ford

A new "$25-a-month" plan for financing retail purchases of new Ford V-8 cars is to be put into effect immediately throughout the United States, Edsel Ford, president of the Ford Motor Co., has announced.

The plan is to be offered through Ford dealers by the Universal Credit Co.

The plan has three important features: 1—Maximum monthly payments of $25, plus the usual down-payment. 2—Finance charges at the rate of one-half of one per cent per month (6 per cent for 12 months) computed upon the total of the original unpaid balance plus insurance cost. 3—Insurance protection at regular conference rates, including not only fire and theft coverage, but also $50 deductible collision insurance protection against other accidental physical damage to the car.

The number of monthly payments may be reduced, or monthly payments less than $25 may be arranged, if a larger down payment is made or if a late model car, valued at more than the usual down payment, is traded-in. The account also may be discharged at any time by full payment of the balance due, in which event a rebate of a portion of the credit charge will be allowed.

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Chevrolet Starts Used-Car Drive; Dealers Get $20 for Each Junked

Chevrolet Motor Co. will start the new year with a $1,000,000 cooperative plan to help move its dealers' stock of used cars, and to remove unworthy vehicles from the highways, M. E. Coyle, president of the company, announces. Beginning on New Year's Day and continuing throughout January two important special activities will run concurrently. First, Chevrolet will pay to the dealer $20 for every old automobile accepted in trade on a new or used car that he disposes of by scrapping or junking. Second, Chevrolet will pay a bonus to salesmen whose efforts enable their dealership to sell more used cars in January than it sold in the same month of 1935.

News of the establishing of the "$1,000,000 Chevrolet Cooperative Used Car Fund," as it has been named, has been dispatched from Detroit to Chevrolet's nine regional and 47 zone managers for transmission by them to all dealerships in their respective territories. As a result of fall new model announcements, Chevrolet new car sales in November and December exceeded all previous records. Chevrolet sold 91,959 new cars in November and 55,915 in the first 20 days of December.

"Naturally, these high sales brought many good used cars into the hands of dealers, thus advancing by two months the period during which we should put on a drive for used car sales," points out W. E. Holler, general sales manager. "Of course, sales of used cars have more than kept pace with new car sales, and from Nov. 1 to Dec. 20 Chevrolet dealers made 189,333 used car sales. Also an all-time record for that period."

British Motor Production Holds Lead Over Year Ago

British motor car production last October was 33 per cent above October, 1934. The estimated passenger car production was 28,311, against 21,190, and commercial vehicle production was slightly lower, 7228, against 8396. Imports of cars and chassis into Great Britain amounted to 750 units last October, and exports were 5906. Sales of passengar cars in Great Britain and Northern Ireland amounted to 23,155. Commercial vehicle imports were only 29 units, while exports were 1054.

Canadian Motor Output Rose 62% in November

Production of 13,496 automobiles in Canada during November was 62 per cent over the 8313 cars made in October, according to official figures. In November, 1934, the output was 1697 cars. There were 5985 new motor vehicles sold in Canada in November valued at $6,100,000, compared with 1711 valued at $1,800,000 in November, 1934. During the first 11 months of 1935, 94,331 cars, trucks and buses were produced valued at $94,700,000, an increase over the corresponding period in 1934 of 32 per cent in unit sales and almost 29 per cent in retail value.

"Blowout-Proof" Tire Claim False, Says FTC

General Tire & Rubber Co. of Akron, Ohio, is charged with unfair competitive methods in a complaint issued by the Federal Trade Commission. According to the complaint, this company advertised in newspapers and over the radio that its "New General Dual Balloon Tire" was "Blowout-Proof," when in fact this was not true. This practice is said to have had a tendency to deceive the tire-purchasing public, and to promote the purchase of these tires in preference to products of similar types and quality offered by other manufacturers, retail dealers and distributors, who did not misleadingly advertise their articles to be blowout-proof.

Friday, Jan. 31, 1936, is designated as the time in which the respondent is to show cause why the Commission should not issue against it an order to cease and desist from the representations alleged.

Herbert Buckman

who has been appointed manager of the Cleveland public auditorium underground exposition hall and stadium. Mr. Buckman will continue for the time being to supervise the activities of the Cleveland Automotive Trade Association.

Police Set Repair Shop Trap for Hit-Run Cars

In an effort to apprehend hit-and-run drivers, Louisville, Ky., has passed an ordinance requiring garagemen to report to the police before beginning repairs on any car which appears to have figured in an accident, and to await inspection of the car by police officers. A garage owner was recently arrested when a car involved in a hit-and-run accident was traced to his shop. He plead that as the car had come in under its own power and was but slightly damaged, he did not suspect that it had been involved in an accident. Louisville police are reported to be making a serious effort to enforce the law, and garagemen will protect themselves by reporting all cars brought in for repairs, unless there is a clear record of the cause of the damage.

Motor Industry's Low Point Was June, '32

Slump Hit Industrial Areas Less Than Farm Regions, Says Scoville

Passenger car sales declined so drastically during the worst years of the depression because the American people had over a trillion miles of transportation in their garages, John W. Scoville, chief statistician of the Chrysler organization, told members of the Econometrics Society this week at a meeting in New York, in a discussion of "The Behavior of the Automobile Industry in Depression."

Mr. Scoville demonstrated that economic recovery began sometime in 1932, if automobile sales can be taken as a criterion. From 1929 to 1932, he said, the number of units produced declined 74.6 per cent and the values of the cars produced dropped 77.8 per cent. Motor vehicle production in 12-month periods does not necessarily follow calendar years, according to the speaker. Passenger car output reached a maximum in the year centered at March 31, 1929, and the same 12-month period was the peak of retail sales of motor vehicles in this country. Commercial car and truck production reached a 12-month maximum in the year centered at Jan. 31, 1929. Mr. Scoville said the 12 months' minima for these three curves were the years centered at June 30, 1932, for passenger car production; Sept. 30, 1932, for retail sales, and Oct. 31, 1932, for truck production.

"Judged by automobile sales," Mr. Scoville said, "the states in the eastern industrial and urban areas suffered less from the depression than the states which are devoted to mining and agriculture. This parallels the world situation, for automobile sales declined less in Great Britain, an industrial nation, than in Australia and Brazil (mining and agricultural countries).

"To the extent that automobile sales are an index of income, farmers and artisans suffered most in the depression and professional people suffered least. . . . The gain in buying in 1936 over

1935, to bring passenger car sales back to the level of 1929, would need to be about as follows: farmers, 382,000, a gain of 138 per cent over 1935; artisans, 464,000, a gain of 124 per cent; tradespeople, 263,000, an increase of 32 per cent; financial, 6300, a 3 per cent increase; miscellaneous, 101,000, a 16 per cent increase. This makes a total of 1,216,300 units over 1935. Nearly 70 per cent of the gain would need to come from farmers and artisans, and each of these groups would need to more than double the number of cars purchased in 1935 to bring the industry back to the 1929 level."

Discussing price trends in the industry, Mr. Scoville said:

"From 1927 to 1933 the wholesale prices of the passenger cars produced each year declined by 33.4 per cent, while the Bureau of Labor Statistics index shows a decline of only 11.7 per cent. . . . Let us compare automobile prices with the U.S.B.L.S. index of wholesale prices of all commodities and with the prices of farm products, this time taking the period 1909 to 1914 as the base period. In this base period the prices of agricultural and industrial products were supposed to be in proper relationship to one another . . . if we accept the theory that deviations from the price ratios that existed a generation ago are evils which should be corrected, then we see that automobile prices are too low and have been below parity since 1912. To be exact, automobile prices should be increased by 121 per cent to bring them back to a parity with the prices of farm products.

"From 1915 to 1919 agricultural prices were so flexible that they increased by 113 per cent and all commodities increased by 100 per cent, while automobile prices were more rigid and increased by only 36 per cent. From 1921 to 1927 farm prices increased by 17 per cent, while automobile prices decreased by 15 per cent. While farm prices increased from 1921 to 1929 and then fell abruptly, automobile prices declined in 10 of the 13 years from 1920 to 1933. In the last 21 years there were only nine years in which farm prices declined, while automobile prices declined in 13 of these 21 years."

Bendix Plans to Enter Marine Products Field

The formation of a new manufacturing and distributing organization in the marine field is announced by Bendix Aviation Corp. The new Bendix subsidiary will be known as Bendix Marine Products Co. The executive and directive personnel will be announced in the very near future, according to Vincent Bendix, chairman of the board of the parent company.

The formation of Bendix Marine Products Co. represents the realization of a program which has been under consideration for some time.

Steel girders for New York's new Triborough Bridge are hauled by Mack trucks and trailers. This 65 ton load is one of heaviest ever carried on pneumatics—each pair of Kelly-Springfield tires carries about 14 tons, an overload of 289 per cent

Heavier Steel Rate Expected Next Month

Automotive Orders Will Keep Finishing Mills Fairly Busy Until Then

Little attention is being paid to continuing rumors that an advance in flat steel prices will be an early 1936 market development. Automotive orders on the books of finishing mills suffice to give them a fairly good operating rate over the first half of the new quarter and heavier buying is looked for by the middle of February. There have been isolated instances to indicate the risk of market raggedness which price advances entail, when not backed up by a corresponding increase in the demand. So, for instance, in spite of the recent $2 per ton advance in the price of wire rods, this description of semi-finished steel was obtainable in one quarter in the last few days at the old price. Whether the $2 advance, that was to have become effective in the market for sheet bars and billets with the end of December, will or will not stand, remains to be seen. Non-integrated rolling mills appear to be fairly well covered for their first quarter's needs of semi-finished material, and it may be some time before the fate of the higher prices is known. Price irregularities in the Detroit market for cold and hot rolled annealed sheets seem to have been a transient affair. Certain it is that, if an advance in sheet and strip prices for the second quarter is announced, its objective will be to "smoke out" all possible tonnage orders in the first quarter, and then it would remain to be seen whether higher prices will put a damper on buying when the first of April draws near. Good demand has been noted in the closing days of the old year for plain and automotive alloy steel bars, with prices entirely unchanged. The jobbing prices of cold-finished bars have been brought into line with the recent price revisions by mills.

Pig Iron—Although a very heavy tonnage of malleable and foundry iron moved in December into automotive foundries, blast furnace sales agents look for a fresh buying wave to develop during the latter part of January. Prices are unchanged.

Aluminum—Piston metal is in good demand. Prices for both primary and secondary aluminum and alloys are unchanged and the market's tone is firm.

Copper—Demand from domestic consumers during the closing days of the old year was brisk, the larger fabricators being the principal buyers. A good deal of tonnage for March and April shipment has been engaged. December sales aggregated around 40,000 tons. Electrolytic is unchanged at 9¼ cents, delivered Connecticut point.

Tin—Importers are keenly disappointed by sales for delivery over the first quarter. Consumers are very slow in committing themselves for other than spot deliveries, and while supplies in Singapore and the market's position at that point are favorable to buyers at present, first hands are reluctant to jump in because of the backwardness of consuming inquiry. Spot Straits tin was quoted at the beginning of the week at 48⅝ cents, a shade higher than at the preceding week's close. New York warehouse stocks are down to 145 tons.

Lead—Contract holders are specifying freely for January shipment, but fresh business is in abeyance. The market is unchanged.

Zinc—Dull and unchanged.

40 Years Ago

—with the ancestors of AUTOMOTIVE INDUSTRIES

One of the foremost coachbuilding firms in the country, a firm whose name is the synonym for superior workmanship the world over, held a meeting of directors not long since and decided that rather than apply motors to their vehicles they would go out of business. While a policy of postponement would rather be expected in so old and conservative a house, a radical declaration like this certainly argues a desire on its part to choose deliberately the latter course.—From the *Horseless Age*, January, 1896.

Congress Flirting with Safety Legislation as It Reconvenes

With the Seventy-fourth Congress convened in its final session Washington observers anticipate considerable jockeying and horse-trading under the guise of political expediency, for many members of both houses of the national legislature must stand for reelection before the assemblage of the Seventy-fifth Congress.

The intense interest of late months in the matter of highway safety has had its effect upon both Senators and Representatives, and some members of both branches are reported ready to present bills making it mandatory for automobile manufacturers to equip powerplants with speed governors. What the outcome of such legislation, if proposed, will be is pure conjecture at this point; legal authorities incline the opinion the Federal Government has no constitutional right to impose such requirements upon manufacturers.

There appears to be some feeling that President Roosevelt will continue to wield considerable influence over the legislators and that Congress will go in the direction he desires.

There is some evidence, paradoxical as it may seem, that the Administration will seek to perpetuate the "breathing spell".

Should the Black 30-hour bill come up it is expected to be passed, passing on to President Roosevelt the responsibility for approval or veto. In any event there is little expectation the measure will become law.

New Stanley Steamer Going Into Production

Stanley Steamers are going back into production, probably within the next 90 days, Harry W. Gahagan, president of Stanley Steam Motors Corp., successor to Stanley Steam Motor Carriage Corp., informs AUTOMOTIVE INDUSTRIES. Present negotiations for volume output of the steam power plant are nearing completion, it is reported, and their eventual consummation appears assured, according to Mr. Gahagan.

According to the Stanley president no attempt will be made to invade the passenger car field at the outset. Rather the company will confine its efforts to the bus field initially, later attacking truck problems and then the tractor field. Passenger car engine production will be the last attempted, if at all. Present plans call for production of two sizes of engines, one for buses of 22-passenger capacity and the other for 44-passenger buses. Both power plants will be of such size, it is said, to give a speed of 60 m.p.h. at 900 r.p.m.

According to Mr. Gahagan, bus installations will be of the rear assembly type, affording great boiler room. He said advantage of every metallurgical advancement of recent years has been taken in designing the new engines. The new engine will burn low grade fuel and have from 37 to 51 moving parts, depending upon the size of the engine.

Auto Felt Corp. to Make New Line of Accessories

W. W. Hoagland, chairman of the board of the Hayes Body Corp., was elected president of the American Auto Felt Corp. of Grand Rapids, Mich., at

W. W. Hoagland

a meeting of the board of directors of the corporation, Dec. 21. At this meeting, the board also decided to launch a three-fold expansion program to take effect immediately. The program will introduce a new line of automotive accessories, including windshield defrosters, winter fronts, summer seat covers, and other miscellaneous related products. The fabric used for some of these products will be tightly woven paper fibre fabric manufactured by the Grand Rapids Fibre Cord Co.

Mather Spring Strike May be Settled Soon

Efforts to reopen the Mather Spring Co. plant in Toledo, closed by a strike of Mechanics Educational Society of America, Local No. 4, are to be made at the end of the current week.

A group of 30 maintenance men went into the plan Monday morning, Dec. 30, to "thaw it out" according to company officials. The plant was closed Nov. 1. Pickets threw lumps of coal at their seven cars when they left the plant in the afternoon and police promptly arrested eight with charges of rioting and property destruction.

Test votes taken by the MESA and independent groups indicated that about 100 were in favor of the strike, and more than 300 in favor of returning to work. At the annual meeting of Local No. 4, held on Sunday, George Becker was reelected president, Burke Cochrane was named vice-president; Earl Streeter, reelected secretary; J. F. Chapman, treasurer; Minor Stansbury, financial secretary, and Stanley Crookes, recording secretary.

Wagstaff Named De Soto General Sales Manager

Appointment of James B. Wagstaff as general sales manager of the De Soto Motor Corp. is announced by Byron C. Foy, president. Mr. Wagstaff has been with the Chrysler Corp. since 1928, when he became assistant sales promotion manager of the Chrysler Sales Corp. When the Plymouth Motor Corp. was organized, he was appointed sales promotion manager, and in 1930 became Plymouth's director of advertising and sales promotion.

Mr. Foy also announced the appointment of Douglas Herrick, formerly assistant to Vice-President L. G. Peed, as assistant to the president.

Fred R. Cooper, formerly assistant regional manager at Pittsburgh, was appointed to succeed Mr. Herrick as assistant to Vice-President Peed.

William W. Romaine has been appointed director of advertising and sales promotion for Plymouth Motor Corp. to succeed J. B. Wagstaff. Mr. Romaine has been with the Chrysler Corp. for the last eight years, and joined Plymouth when it was first organized. He became assistant director of advertising and sales promotion for Plymouth five years ago.

The appointment was announced by D. S. Eddins, Plymouth president, who also announced appointment of Neal Nyland to succeed Mr. Romaine as assistant director of advertising and sales promotion.

GM Winter Showings In 50 Cities Begin Feb. 1

"Building prosperity with greater values" will be the slogan of General Motors, when it stages winter showings of its products in 50 cities throughout the country starting Feb. 1. These exhibits will replace the spring shows held in the past, the dates being advanced because of the earlier introduction of new models and in order that the stimulus to sales may be derived before normal expansion of the market in the spring.

Budd Gets Order for New International Truck Dies

The International Harvester Co. has placed an order with the Edward G. Budd Manufacturing Co. for dies and steel stampings to be used in the production of its 1936 model trucks. It is reported that this is the first order the Budd Co. has received from International.

Edward P. Warner

Warner Now Consultant

Edward P. Warner, until recently editor of *Aviation*, and formerly assistant secretary of the Navy for aeronautics, has opened an office as consulting aviation engineer in New York, at 122 East 42nd Street. Mr. Warner is now in Chicago, and will visit West Coast aviation plants before returning to his office early in February.

Ackerman-Blaesser Take More Factory Space

Ackerman-Blaesser-Fezzey, Inc., manufacturers of window regulators, have taken over the entire plant at 1258 Holden Ave., Detroit, which the company formerly occupied only in part. The additional space enlarges the factory by one-third, providing room for rearrangement and modernization of its operations and permitting also the doubling of its office space.

Independent Union Combine Snagged When 25 AIWA Locals Balk at Plan

Official launching of the new Automobile and Metal Workers' Industrial Union, scheduled for Feb. 1 at the second convention called for that purpose in Detroit, will do little to simplify the complex labor union set-up in the motor industry. With unification of all independent organizations in the industry as its goal, and with the three leading groups already committed to the plan, the movement ran into difficulties that very nearly wrecked the hopes of its sponsors before the first constitutional convention was held on Dec. 21.

Had the original plans gone through, four smaller organizations would have been replaced by one big union which, with the A.F.L.'s United Automobile Workers of America, would have given workers of the industry the choice of two dominant and more or less powerful bargaining agencies. The new organization would have united the Automotive Industrial Workers Association, the Associated Automobile Workers of America, the Mechanics Educational Society and doubtless the Dingmen's Club whose leaders had indicated a desire to join.

As it now stands the amalgamation plan embraces only the A.A.W.A., the M.E.S.A., and the Motor Products local of the A.I.W.A. The other 25 locals of that union, whose membership is said to be as great as that of the two merging unions combined, withdrew when differences arose over the strike, and rivalry of leaders developed. Unquestionably, embarrassment occasioned by the now apparent failure of the Motor Products strike was an important factor in the decision of the A.I.W.A.'s leaders to remain in the background for the present.

If nothing develops meanwhile to thwart the consummation of the merger in its present form, at least three names will be effaced from the roster of union organizations in the motor industry. The more stable A.A.W.A. and the decadent M.E.S.A. will, of course, pass from the picture. So also will the Brotherhood of Allied Automobile Workers, a federation of the independent unions which had ceased to function when the consolidation movement got under way. The relatively small Dingmen's Club, a union of skilled workers who remove dents from finished automobile bodies, may lose its identity if, as now expected, it decides to go along with the new organization.

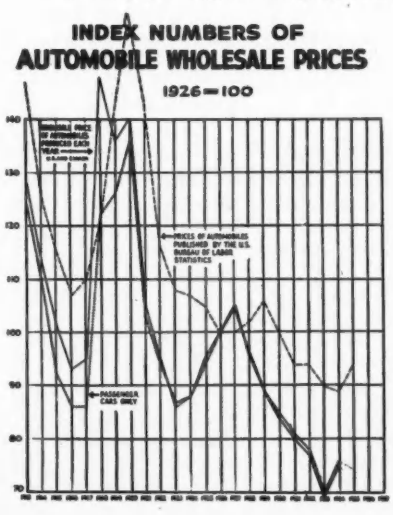
Toledo Unions Vote for International Charter

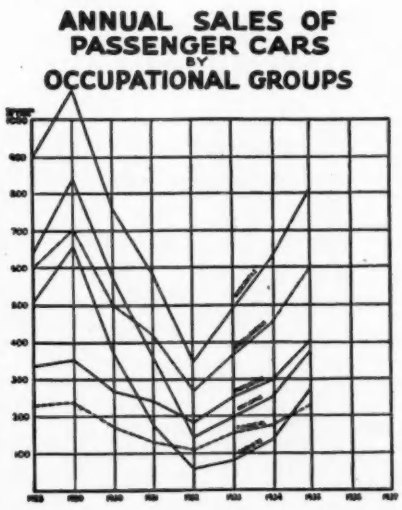
Acceptance of the charter tendered by the International Automobile Workers Union was voted at Toledo, at a mass meeting of the United Automobile Workers Federal Union No. 18384 in the civic auditorium Sunday. It was considered a victory for the conservative element in the union, and was tantamount to giving up the old federal union idea for membership in the American Federation of Labor body headed by Francis J. Dillon, of Detroit.

Ellsworth Kramer, president, explained that the new charter which was city-wide in scope is probationary, but he declared there is no time limit to the probationary period.

Two Significant Phases of Automobile Sales

The two charts below were presented by John Scoville, statistician, Chrysler Corp., as part of a paper on the "Behavior of the Automobile Industry During Depression," at a meeting of the Econometric Society in New York on Dec. 30. Excerpts from Mr. Scoville's paper appear on page 2 of this issue.





ICC Agrees to Further Delay for Carrier Act

Due to a request from motor carriers for more time to compile tariffs and schedules, the Interstate Commerce Commission today postponed until April 1 the effective date of sections of the Motor Carrier Act relating to rates, bills of lading and collection of dues. The tariffs must be filed by March second. This is the fourth postponement of the effective date of these provisions which originally were to have become operative December 1. Under the act, no further postponement of any of its provisions is permissible.

Willys-Overland Resumes Production of 5000 Cars

Willy-Overland Co. is now back into production on the last half of the 10,000-car authorization from the Federal court. About 300 units a week are being turned out at the plant and 1500 workers are now on the payroll.

Drive to Bring More Air Records to U. S. Begins

An intensive drive to secure additional air records for the United States will be launched by the National Aeronautic Association on Feb. 1, according to an announcement made this week by the association. The United States is at present in first place among the nations, but by a margin of one record only. Against the 39 records held here, France holds 38, Italy follows with 28, Germany with eight, Poland holds eight, and England has but one.

The association has announced that a $100 cash prize will be awarded the first American pilot who sets or breaks an international record for the United States after Feb. 1. In addition, the contest board of the association has agreed to waive all fees in connection with the certification of the record before the Fédération Aéronautique Internationale in Paris for the first record winner. This prize is restricted to light aiplanes, light seaplanes and light amphibian categories. It is open to every plane owner and pilot in the nation.

Birmingham Changes to Buses on Five Car Lines

The latest city to move for a change from street-cars to buses is Birmingham, Ala., where a tentative agreement has been reached between the city and the Birmingham Electric Co. By the terms of this accord, buses will replace street-cars on five lines. The change-over will require from three to four months. Plans provide for the use of 53 buses.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

There was a seasonal decline in some manufacturing industries last week. Steel operations were on a lower scale, but the outlook after the turn of the year appears to be bright. The steel industry predicts that February operations will reach 60 per cent of capacity. Holiday sales are reported to be the best in five years.

The index of business activity compiled by the Guaranty Trust Company for November stood at 80.3, as against 77.2 the month before and 65.4 a year ago. The company's index of wholesale commodity prices on Dec. 15 was 52.5, as compared with 55.1 a month earlier and 51.6 a year ago.

Shipments Top Last Year

Railway freight loadings during the week ended Dec. 21 totaled 599,534 cars, which marks a decline of 15,703 cars below those in the preceding week, an increase of 51,056 cars above those a year ago, and an increase of 68,070 cars above those two years ago.

Food Prices Continue Up

The index of retail food costs during the two weeks ended Dec. 3 increased 0.6 per cent, according to the Bureau of Labor Statistics. The current index stands at 82.0, based on the 1923-25 average as 100, as against 81.5 on Nov. 19 and 74.8 a year ago. The rise was general throughout the country, although it was more pronounced in the Central and Mountain States.

Power Production at New High

Production of electricity by the electric light and power industry in the United States during the week ended Dec. 21 reached the ninth successive weekly high, with the exception of the week ended Nov. 30. The current level is 12 per cent above that in the corresponding week last year.

Exports Increase

The total value of exports during November moved sharply upward contrary to the usual seasonal trend, while imports declined by considerably more than the seasonal amount. Exports showed a gain of 22 per cent above those in October and 38 per cent above those a year ago. Imports were 11 per cent below those in October and 12 per cent above those in November, 1934. The export balance for the first 11 months of this year amounted to $197,000,000, as against one of $439,350,000 in the corresponding period last year.

Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended Dec. 28 stood at 84.1, as against 84.4 the week before and 84.0 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Dec. 24 showed an increase in holdings of government securities of $1,000,000. Holdings of bills bought in the open market and of discounted bills remained unchanged. Money in circulation increased $89,000,000, and the monetary gold stock increased $16,000,000.

Spain Hopes For Trade Treaty Soon

Long Delays in Getting Dollar Exchange Add to Car Importers' Troubles

Special to AUTOMOTIVE INDUSTRIES

Motor car salesrooms along the automobile rows of Barcelona, Madrid and other Spanish cities are empty, due to the inability of dealers and factory branches to obtain stocks from abroad. Many reasons, both political and economic, contribute to this condition.

It is confidently expected in Spain that before another month has passed the reciprocal trade agreement between Spain and the United States, which has been in process of negotiation for more than a year, will have been signed. When this treaty goes into effect, two of the principal handicaps to the Spanish motor business will be eliminated. The first of these is the present high tariff on cars and parts, and the second, the restriction on money conversion.

It has become increasingly difficult to obtain dollar exchange to pay for imports into Spain. A delay of but a few weeks was experienced at the outset of the restrictions imposed by the Centro de Contratacion de Moneda, at Madrid, but at present requisitions are being honored only after a lapse of from seven to nine months. Even longer delays have been reported by some American firms. Pounds sterling are generally obtainable within seven months, and German marks virtually on sight.

The result of this condition has been the tieing-up of considerable sums of American capital in Spain, which lie idle in Madrid and Barcelona banks, receiving the very low interest rate of one per cent.

The automobile business in Spain is also affected by the dispute between the independent truck and bus operators, now grouped in the Comité Nacional de Entidades de Auto Transportes, and the government. The organization accuses the government of "levying abnormally high taxes on all manner of highway transportation, excepting privately owned and operated cars, at the instance of the chief railway systems of the country, and their bus operating subsidiaries." The high tax program went into effect last August, and has recently been suspended, although not definitely rescinded.

While the difficulties between the truck and bus operators and the government are a matter of domestic concern, their effects have been felt severely by importers, both European and American. Many of the commercial vehicles driven from the highways by high taxation had been sold on time payments, so that their owners are at present in default on their paper.

The General Motors subsidiary in Spain is now largely dependent for sales on its small German-made Opel.

New Models Raise November Passenger Car Exports 174% Over Same Month Last Year

Exports and Imports of the Automotive Industry for November and Eleven Months Ended November 1935 and 1934

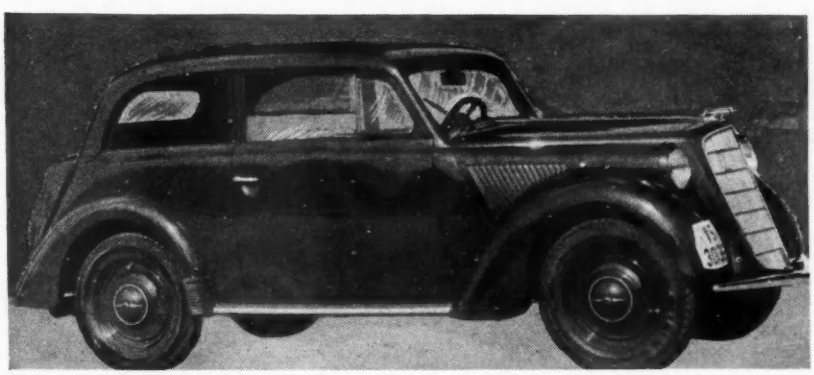
	November				Eleven Months Ended November			
	1935		1934		1935		1934	
	Number	Value	Number	Value	Number	Value	Number	Value
EXPORTS								
Motor Vehicles, parts and accessories	....	$21,884,674	....	$11,017,531	....	$207,567,294	....	$177,795,605
PASSENGER CARS								
Passenger cars and chassis	22,491	11,185,722	9,208	4,071,121	155,944	85,595,844	136,876	74,362,633
Low price range $850 inclusive	21,476	10,024,520	8,572	3,332,506	144,988	73,755,262	125,777	62,110,261
Medium price range over $850 to $1,200	613	598,337	373	364,388	7,918	7,522,009	7,396	7,133,410
$1,200 to $2,000	200	289,777	84	127,462	1,255	1,913,021	1,928	2,926,649
Over $2,000	91	226,285	88	213,492	758	1,980,837	685	1,774,018
COMMERCIAL VEHICLES								
Motor trucks, buses and chassis (total)	8,038	3,881,597	7,062	3,322,897	88,804	45,918,262	85,582	40,473,083
Under one ton	1,495	454,359	777	264,319	8,976	3,023,858	8,744	2,867,911
One and up to 1½ tons	5,267	2,416,684	5,340	2,209,188	63,791	29,315,227	66,369	27,834,334
Over 1½ tons to 2½ tons	1,018	746,808	849	721,992	13,286	9,777,668	8,509	6,878,620
Over 2½ tons	217	236,041	76	113,827	2,250	3,386,519	1,594	2,651,517
PARTS, ETC.								
Parts except engines and tires	....	.....	....	.....	....	.....	....	.....
Automobile unit assemblies	....	3,253,931	....	1,163,025	....	41,919,479	....	34,115,663
Automobile parts for replacement (n.e.s.)	....	2,345,828	....	1,834,877	....	24,198,645	....	20,025,069
Automobile accessories (n.e.s.)	....	294,870	....	192,913	....	2,874,133	....	2,353,323
Automobile service appliances	....	270,598	....	214,711	....	1,732,969	....	2,216,309
Airplanes, seaplanes and other aircraft	26	315,151	15	360,816	322	6,163,769	471	7,744,411
Parts of airplanes, except engines and tires	....	570,051	....	695,649	....	4,790,823	....	4,429,854
INTERNAL COMBUSTION ENGINES								
Stationary & Portable								
Diesel and semi-Diesel	41	73,256	19	129,036	301	803,098	130	370,751
Other stationary and portable	....	.....	....	.....	....	.....	....	.....
Not over 10 hp.	688	49,767	458	29,254	8,878	524,046	5,347	344,127
Over 10 hp.	70	40,946	162	70,676	1,311	745,553	1,060	600,525
Automobile engines for:								
Motor trucks and buses	2,367	220,048	172	23,593	6,816	790,725	3,845	505,868
Passenger cars	3,976	344,589	239	18,913	26,002	1,765,825	20,448	1,295,278
Engines and aircraft	90	448,002	82	577,007	554	2,392,314	941	3,917,403
Accessories and parts (carburetors)	....	134,832	....	101,560	....	1,473,706	....	1,246,117
IMPORTS								
Automobile and chassis (dutiable)	85	35,295	61	22,647	550	266,398	526	140,913

This, with the General Motors German-built Blitz truck, is enjoying increasing sales. The relatively few American and Canadian-built cars which General Motors, as well as other American companies, are able to import into Spain are usually sold long before their arrival.

The Ford V-8, imported from the United States, and to a limited extent, from Canada, is one of the most popular cars on the Spanish market. From the English Ford plant at Dagenham, the small 8 hp. and 9 hp. European types are being imported, and compete successfully with other European makes, such as the small Citroens, Fiats and Renaults. The Barcelona Ford plant is having relatively little difficulty in getting its requirements into the country due to the fact that certain privileges were accorded it when the national regulations went into effect in 1931, in recognition of the company's agreement to use a certain percentage of Spanish materials in the cars. Ford Motors Iberica, S.A.E., is therefore on a parity with the domestic plants. No automotive plant in the country, it is said, is using a greater proportion of Spanish materials, except Hispano-Suiza. Among the domestic materials being used by the Ford plant are storage batteries, tires, upholstering and body materials, and many miscellaneous parts.

Total registration of motor vehicles in Spain during the first ten months of this year, according to official figures, is as follows:

	Total Units	Passenger Cars	Trucks
Totals	20,664	13,541	7,123
American makes	9,595	3,508	6,087
English "	3,837	3,631	206
German "	3,024	2,571	453
French "	2,380	2,118	262
Italian "	1,552	1,518	34
Spanish "	134	69	65
Other "	142	126	16



GM German-built Opel is popular in Spain

Fire Engine Sales Rise

Shipments of motor fire-extinguishing equipment, as reported to the Bureau of the Census, amounted in November, 1935, to 65 units, against 59 in October, and 25 in November, 1934.

Used-Car Stocks Increased 50%

(*Continued from page* 1)

ply (on working day basis) and general sentiment regarding sales outlook for the next 60 days AUTOMOTIVE INDUSTRIES' reporters interviewed representative dealers in each of the cities included in the study. The questions asked were: (1) How do used car stocks now compare with one year ago; (2) How do used car stocks compare with Nov. 1, 1935; (3) Is the market for used cars currently regarded as good, fair, poor, giving consideration to the season; (4) How many days supply of used cars do dealers figure they have on hand; (5) What is the general sentiment regarding the outlook for used car sales in the next 60 days?

A city-by-city résumé of answers given AUTOMOTIVE INDUSTRIES to these questions follows:

Detroit—Stocks generally double range 60 per cent to 300 per cent higher; comparison with November 1, 1935, about the same; market generally fair; supply averages about 60 days; sentiment for poor January with better February business.

New York—Stocks 37 per cent higher; higher in comparison with November 1, 1935; Market fair; supply averaging about 50 days; prospects fair for sales in next 60 days.

Philadelphia—Stocks generally 40 per cent higher; somewhat higher than November 1, 1935; supply averaging about 45 days on major lines and 60 days on slower moving makes; outlook not encouraging for next 60 days.

Boston—Stocks averaging about 30 per cent higher; normal increase over November 1, 1935; supply ranging around 50 days; market fair; outlook for next 60 days fair, sales-wise.

Washington—Stocks 100 per cent higher; increased over November 1, 1935; market fair; supply about 45 days; sales outlook during next 60 days poor.

San Francisco—Stocks 20 per cent higher; slightly above November 1, 1935; opinion divided on current market between poor and fair; supply about 55 days; outlook hopeful but not optimistic.

Wilmington, Del.—Stocks up about 35 per cent; considerable increase over November 1, 1935; market currently fair; supply averaging about 60 days; outlook for next two months poor.

St. Louis—Stocks up 25 per cent; material increase over November 1, 1935; market considered poor; supply somewhat better than 60 days; sales outlook poor until spring.

Birmingham, Ala.—Stocks 20 per cent higher; lower than November 1, 1935; about 25 days' supply; market considered fair; outlook for next 60 days fair.

Pittsburgh—Stocks averaging 100 per cent higher; about 75 per cent above November 1, 1935; current market between fair and poor; supply averaging about 45 days; sales outlook for next 60 days fair.

South Bend—Stocks 50 per cent higher; only slight increase over November 1, 1935; current market poor (bad weather); supply about 90 days; outlook for next 60 days considered fair.

Austin, Tex.—Stocks approximately 35 per cent higher; increased 20 per cent over November 1, 1935; current market fair; supply averages 60 days; sales outlook slow for next 60 days.

Cleveland—Stocks 35 per cent higher; heavy increase since November 1, 1935; estimate supply at 60 days; market generally fair; outlook slack for January, normal for February.

Baltimore—Stocks 50 per cent higher; increase since November 1, 1935 about 30 per cent; market currently good; supply about 45 days; outlook fair during next 60 days.

Toledo—Stocks increased 20 per cent; somewhat larger than on November 1, 1935; current market considered fair; supply ranges about 50 days; general outlook for next 60 days fair.

Sprinfield, O.—Stocks 100 per cent higher; increase about one-third over November 1, 1935; current market fair; 60 days' supply; sentiment uncertain over outlook for next 60 days.

Springfield, Mass.—Stocks 30 per cent higher; increased about 10 per cent since November 1, 1935; current market good; supply about 60 days; outlook good for next 60 days.

Milwaukee—Stocks 70 per cent; increased 25 per cent over November 1, 1935; current market good; supply averages about 50 days; outlet during next 60 days fair.

Buffalo—Stocks average about 35 per cent higher than year ago; increase about 50 per cent over November 1, 1935; supply averages about 45 days; current market fair; outlook for next 60 days fair.

Chicago—Stocks about 50 per cent higher; show moderate increase over November 1, 1935; current market generally fair; supply averages about 45 days; outlook fair for next 60 days.

Akron—Stocks up about 90 per cent; increase about 40 per cent over November 1, 1935; current market sluggish; supply about 75 days; outlook for next 60 days appears fair.

Spartanburg, S. C.—Stocks 30 per cent higher; increase about 15 per cent over November 1, 1935; current market poor; supply averaging about 60 days; outlook for next 60 days poor.

Minneapolis—Stocks approximately 100 per cent greater; 55 per cent increase over November 1, 1935; current market very poor; supply 60 days; outlook for next 60 days poor.

Output Slightly Below Last Month

(*Continued from page* 1)

basis of present plans, January should account for close to 375,000 units, which compares with approximately 400,000 units indicated for December and 422,538 in the record January of 1929.

Having attained almost spring-time level, the production rate was checked last month by holiday closings and will not be in full swing again until the first of the week.

Although the industry turned out roughly 1,255,000 more vehicles in 1935 than in 1934, its leaders look confidently forward to a 1936 production exceeding the 4,150,000 units built in 1935. While some expect a substantial gain, no one is so optimistic as to expect an increase over the preceding year equal to that made in 1935. It must be remembered that the year just ended enjoyed two new model seasons, the most pressing replacement demand has been filled, and the current year has also to experience the uncertainties of national elections. The more conservative would be satisfied to top last year's figure by 100,000 to 250,000 units at the outside.

December sales were running slightly under the November rate, according to available reports, which do not cover the full month. Indications were that deliveries would be less than 10 per cent under the November total of 310,000 cars and trucks, or in the neighborhood of 382,000 units. Of the November total, over 264,000 were passenger cars and nearly 46,000 were trucks. As was expected, November registrations lagged considerably, totaling 220,262 for passenger cars and 37,616 for trucks, or an aggregate of 257,878 vehicles. With Christmas buying over, and with weather conditions unfavorable to moving both new and used cars, further recession in retail sales is expected in January.

November Registrations Gained 105%

November new car registrations totaled 220,262 compared with 148,389 in October and 107,574 for November, 1934. During the January-November period of the year just closed the new car registration was 2,506,714 against 1,813,201 for the corresponding 1934 period. These increases represent gains of 105 per cent for November, 1935, over the same month of 1934; 48.4 per cent above October, 1935, and for the 11 months a gain of 38.1 per cent. New truck registrations for November were 37,616 against 43,243 in October and 28,689 for November, 1934, representing a loss of 13 per cent in the November-October totals and a gain of 31.1 per cent over the preceding November. The eleven months total was 479,754, an increase of 26.3 per cent over the 379,816 registrations for the same period of 1934.

Caterpillar Brings Out Three New Diesel Units

Caterpillar Tractor Co., Peoria, Ill., has announced three new Diesel power units which extend its line of such units in both the upward and downward directions. The D17000 is an eight-cylinder 160-hp. V type engine with cylinders of 5¾ in. bore by 8 in. stroke, the two banks being arranged at an angle of 60 deg. Then there is a three-cylinder 60-hp. and a four-cylinder 44-hp. model. The 160-hp. engine is designed solely for stationary use; it weighs 7150 lb. and as a complete powerplant, 11,500 lb.

CALENDAR OF COMING EVENTS

SHOWS

National Motor Boat Show, New York, Jan. 17-25, 1936

Amsterdam, Netherlands, Automobile Show .....Jan. 31-Feb. 9

CONVENTIONS AND MEETINGS

National Aeronautic Association, Annual Convention, Washington, D. C., Jan. 6-7

S.A.E. Annual Meeting, Detroit..Jan. 13-17

American Roadbuilders Assoc., Cleveland .....Jan. 20-24

Assn. Highway Officials of No. Atlantic States, Atlantic City .....Feb. 12-14

American Society for Testing Materials, Regional Meeting, Pittsburgh, March 4

U. S. Chamber of Commerce, Annual Meeting, Washington .....April 27-30

The WORLD on WHEELS

Italian Army progress is slow on mountain trails in Ethiopia.
International Photo

Safety highway in St. Louis is completely free of cross traffic and bars pedestrians for entire three-mile length.
Acme Photo

American press correspondents have to get out and push on their way to the Ethiopian front
International Photo

Cabin of the DO-X on way to be placed in new German air museum at Ulap.
European Photo

Pre-war London bus has been loaned to the City of Vancouver for its jubilee celebration this year.
Keystone Photo

Brussels, Belgium, truck owners protest excessive taxation; this truck paid taxes in one year amounting to 68% of its original price.
European Photo

. . . That Was 1935 in the Automotive

Men, Money and Motors Contributed Much to the National Economy In a Year Marked by Departures from Tradition to New Records

By T. Lawton Slaugh

THE automotive industry set a high goal for itself in 1935—and surpassed it.

A summary review of the movements and developments within the industry during the past year proved its leadership of all American industry when in the face of hampering legislation and uncertain economic policies it proceeded with the expenditures of enormous sums of money in new plants, tools, machinery and inventories of materials, thus giving employment to hundreds of thousands of workers outside its boundaries; directly employed nearly a half-million men and women and paid weekly wages averaging $13,300,000.

Outstanding among the industry's accomplishments was its sales and production record. At the beginning of the year just ended automotive leaders estimated a production increase of 15 per cent over the preceding year—actually that increase was 45 per cent for an estimated total of 4,150,000 units and sales closed at the end of December 39 per cent above those for the 12 months of 1934.

From the opening of the January show straight through to the November announcement of 1936 models retail demand for new cars hit and maintained one of the most rapid paces experienced in the entire 40 years of the industry's existence. Sales at the opening of the year led production by a considerable margin and factories were forced to step-up production schedules upon several occasions. Before the first quarter ended, the first million passenger cars and trucks were off the assembly lines. The final total for the January-March period was 1,109,046 units, a 47 per cent gain over the corresponding period of the previous year. Sales made an even greater gain with 802,080 units, an increase of 62.5 per cent.

When March production skyrocketed to 451,809 units it appeared certain April would be the high-spot of output for 1935 and this month showed 501,867 units, the largest April on record excepting 1929. Sales continued moving to higher ground, and while a seige of bad weather in early May had a depressing effect the June curve moved steadily upward. The first half closed with an output record of 2,373,465 cars and trucks produced, a 32 per cent increase, while sales for the January-June period again led output in percentage gained, sales during the first six months totaled 1,973,470 passenger cars and trucks, 40.3 per cent above the same period of the preceding year.

Coming into the second half of the year sales continued strong. Changeovers for new models were imminent because of the advanced announcement date and factories began gearing production to sales. The third quarter output brought the total for the first nine months to 3,066,453 units, surpassing the estimated 15 per cent increase of the previous January by more than 8 per cent while sales for the period were 32.3 per cent above the corresponding 1934 period.

The agreement entered into with President Roosevelt by the automobile manufacturers to announce new models simultaneously and at a date considerably earlier than usual advanced the shut-down date from November to August with the result that September was the lowest production month of the year with 95,128 units. However, new car demand continued around 200,000 units monthly and the troublesome clean-up problem was practically eliminated; no high pressure tactics in the form of drastic price cuts and exorbitant trade-in allowances were necessary to move models soon to become obsolete.

Factories reopened in October and production bounded upward as every effort was made to have sufficient stocks of 1936 models in dealers' hands by the November show date. During October 283,334 cars and trucks were turned out and the November production stepped-up to 411,520 units. With the November show sales gathered new impetus and a quick, upward revision

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1936 Finds Used-Car Problem Sharing "Honors" with Profit Search

By Herbert Hosking

THE moving finger writes . . . 1936, and the automotive industries are moving on. Where? So far as the year 1936 is concerned, Alfred P. Sloan thinks "that it is perfectly possible to accelerate the progress of 1935 and to broaden it into a sound forward movement extending all along the line of constructive endeavor. The fundamental factors bear evidence of such a possibility." On this note of "cautious optimism," Mr. Sloan is sustained by the Hon. Daniel C. Roper, Secretary of Commerce, and most of the executives in the automobile manufacturing field.

The president of the General Motors Corp. and the Secretary of Commerce are not entirely in accord, however, with regard to certain signs which must be watched. If the Secretary of Commerce believes any of them to be political, he does not say so, while Mr. Sloan indicates clearly "that to deal with the probabilities is quite a different matter. Here we must attempt to appraise the effect of political action, as it may accelerate or decelerate the normal processes of recovery. After the so-called 'breathing spell'—what? Is constructive enterprise to be further penalized?"

"To what extent," Mr. Sloan con-

(Turn to page 16, please)

e Industries, as the Records Show

of December schedules was necessitated in a mad scramble to keep output somewhere near sales. Banks of unfilled orders mounted rapidly at factories and the estimated December production ran close to 495,000 units.

The year closed with an output record of approximately 4,150,000 cars and trucks turned off the assembly lines and the sales totaled and estimated 3,777,000 units While these figures are estimated on sound statistical basis the final figures will be reported in the annual *Statistical Issue* of AUTOMOTIVE INDUSTRIES, February 22.

Complete totals of 1935 exports of automotive products are not available as this report is prepared. However, for the eleven months of the year, ending Nov. 31, the value of our overseas business was $207,567,294 compared with $177,795,605 for the same 1934 period. Passenger cars and chassis exported during 1935 were 155,944 against 136,-876 for the corresponding period of the previous year. There were 88,804 commercial vehicles exported comparing with 85,582 for 1934.

From the standpoint of mechanical developments, 1935 was not an outstanding year; few striking novelties were introduced, but a number of features that appeared for the first time the previous year or two found wider acceptance.

Two entirely new cars were placed on the market for the 1936 season, the Cord front-drive V-8 and the Lincoln Zephyr equipped with a V-12 engine. In addition to these, two other cars came out with entirely new engines, the Studebaker Dictator and the Cadillac V-8.

In pistons there has been a further move toward the aluminum type, and practically 90 per cent of all models now carry pistons of the light alloy. In the Lincoln Zephyr a new type of cast steel piston is being introduced, the material being a copper-alloyed steel, and the walls of very light section.

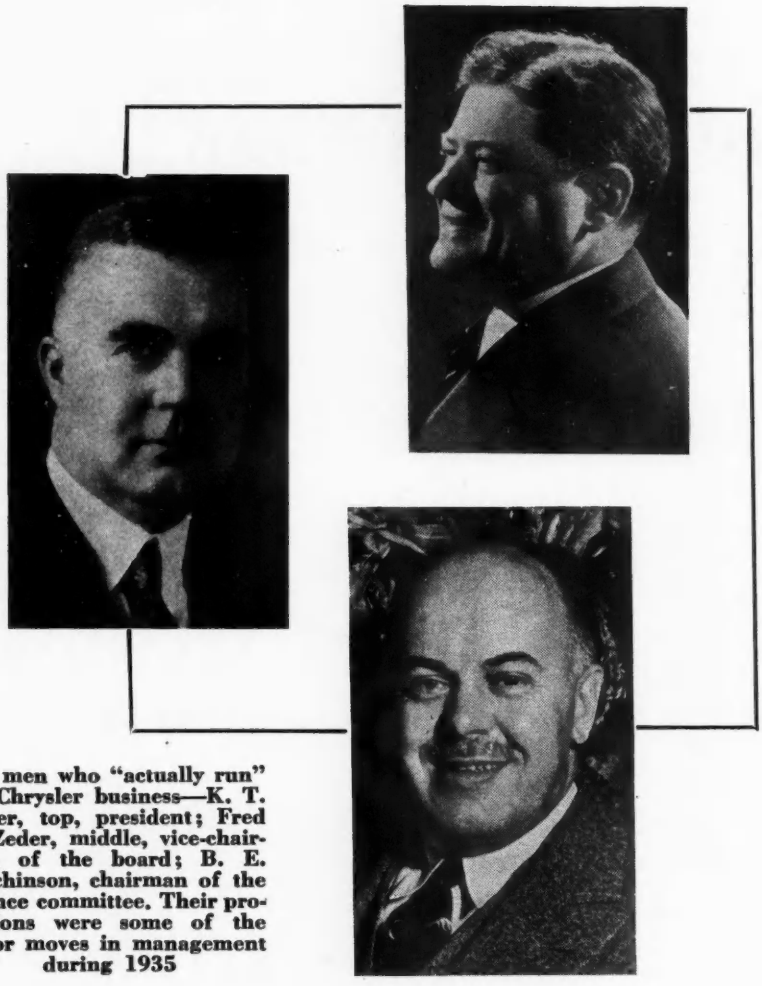
Another development in engine design is found in the Buick and Chevrolet engines in which arrangements are made for heat interchange between the lubricating oil and the cooling water within the engine itself, instead of in an outside heat exchange or oil cooler. In the Buick the oil is carried through the rocker-arm tube of the overhead valve gear, and a small tube carrying cooling water extends through the rocker tube. On the Chevrolet the oil on its way to the rocker tube, passes a tube extending up through the water jacket of the cylinder block. When heat is thus applied to the oil in the rocker tube via the cooling water, the operation of the valves becomes quiet more rapidly after a start from cold.

A few more manufacturers have adopted "packingless" water pumps and the plan of keeping the cooling system under light pressure thus making it possible to operate the engine at a higher temperature and more efficiently, has also gained adherents.

In the fuel system, attention has been given to means of preventing vapor lock and of improving the distribution to the various cylinders. The Carter carburetor has an "anti-percolating" device, a throttle-controlled vent in the top of the float chamber, which permits vapors in the chamber to escape into the atmosphere, so that they will not interfere with the metering operation. The Pontiac engine has a new manifold provided with dams at the intermediate outlets which are intended to prevent an excessive amount of fuel reaching the end outlets.

One of the few innovations in steering gears is found on the Cadillac, on which the steering column, mounted on the car body, is offset from the worm shaft of the steering gear, mounted on the frame side rail and the two connected by a short intermediate shaft with universal joints.

Alfred P. Sloan, Jr., Walter P. Chrysler and Henry Ford, the "Big Three" who directed expenditures totaling nearly $160,000,000 during 1935 for plant expansions, new equipment and stabilization of employment



The men who "actually run" the Chrysler business—K. T. Keller, top, president; Fred M. Zeder, middle, vice-chairman of the board; B. E. Hutchinson, chairman of the finance committee. Their promotions were some of the major moves in management during 1935

As all General Motors cars are now fitted with hydraulic brakes, there has been quite a shift to that type, which is now represented on 81.2 per cent of all car models, as compared with 56.2 per cent in 1934. A new feature of Studebaker cars is the automatic "hill holder," which makes it possible for the driver when starting on an upgrade to move his foot from the brake pedal to the accelerator pedal without the car rolling backward.

The number of cars with independent front suspensions has increased slightly, one of the newcomers is the Cord, a suspension embodying a transverse half-elliptical spring. The drive shafts of this front-drive car extend through large openings punched in the side members of the frame.

With most cars employing the conventional half-elliptical springs at the front, the springs have been considerably softened and the range of action has been increased to obtain the advantage of comparative freedom from pitching. When such highly flexible springs are used for the front suspension, some additional connection between the front axle and the frame is necessary to assure positive steering, engineers point out, to take care of the braking torque. In Hudson and Terraplane models this is provided for by connecting the front axle with the frame side rails by torque arms.

The one innovation of the year that may prove to be an important departure in automobile practice is the elimination of a separate chassis frame in the Stout Scarab and the Lincoln Zephyr. For many years engineers have been endeavoring to increase torsional rigidity of their chassis frames by such devices as X members, box sections, etc. This naturally has led to an increase in frame weights. Experts point out it is obvious that greater torsional stiffness can be obtained with a given amount of material if there is only a single frame.

Problems of body ventilation were given further attention and a rather interesting system has been provided on Hudson and Terraplane cars. This system aims at providing thorough ventilation without draft, and at the same time to filter the air entering the body through the ventilator opening. By exploring the outside of a car in motion with respect to pressure distribution it was found that one of the points of highest pressure distribution is under the floor below the rear seat. A ventilating opening is provided in the floor at this point and covered with a filter cloth. The air enters here and escapes through the partly opened front windows.

Truck and bus men appear agreed that the development of safety features such as the almost universal adoption of hydraulic brakes, improved engine performance and perfection of air conditioned cabs and the first streamlining in trucks, wide spread use of color combinations as an appeal to get more than a million old trucks off the roads were the most significant developments in this field during the past year.

No review of the automotive per se would be complete without some consideration of the aeronautical field. Students of this phase of modern transportation concur that the following list are the significant and outstanding contributions of aviation during 1935. No attempt has been made by the writer to list these developments in the order of their importance as they may appear to air men or automotive engineers. They are:

Inauguration of trans-Pacific transport schedule by Pan American using China Clipper ship.

The stratoshere flight, establishing a new world's record, made by Stevens and Anderson.

The blind flying development with particular reference to blind landings for transport operations which resulted in the award during the year to Captain Hegenberger, of the Army Air Corps, of the Collier Trophy.

The establishment of a new world's speed record for landplanes by Howard Hughes.

The production application of the magnaflux method of crack detection for application to parts of engines, forgings, and propeller hubs for airplanes.

Successful development by Wright Aeronautical Corporation of two-speed supercharger.

Successful development by Wright Aeronautical Corporation of dynamic balance for crankshafts.

The development, through the cooperative effort of Goodrich and T.W.A. and the Bureau of Air Commerce, of deicing equipment, applied in service on the wings of airplanes, and at the end of the year development for use on propeller hubs and blades.

Development during the year of the automatic controllable pitch propeller tried out in service by United Air Lines using Hamilton-Standard equip-

ment and by the Army Air Corps using Curtiss Aeroplane & Motor Company equipment.

The development of the air mass principle for use in weather prediction by Willet and Rossby and for which the Reed Award of the Institute of Aeronautical Sciences was given.

The record transcontinental flight of Tomlinson in a T.W.A. transport.

The successful landing by Ray of an Autogiro on the roof of the Philadelphia Post Office.

The development of the Pratt & Whitney automatic mixture and boost control for carburetors.

Development by Vought and the Navy of the controllable cowl flap for aircooled radial engines equipped with N.A.C.A. cowling.

The quantity service use of the Sperry Automatic Pilot by T.W.A.

The work of Allen and Oswald in developing transport flying technique with particular reference to the proper coordination of the engine, propeller and flying instruments for use at different altitudes. This has been supplemented by the work of Rockefeller of the California Institute of Technology in connection with wind velocity soundings and flying technique to best take advantage of favoring winds.

Development of the four-engined Bomber by Boeing Airplane Company for the Army Air Corps.

Developments in the tractor field during the past year were ably summarized in the December 28 issue of *Automotive Industries* by P. M. Heldt and A. F. Waddel. Therefore a passing mention of this part of the industry will suffice in this review of the year. Most tractor experts are agreed that most significant development in the tractor field during the past year was the continued substantial expansion of the use of the Diesel-powered equipment due both to power efficiency and substantial savings in operations.

A brief review of the motor fuel situation shows that, according to the American Petroleum Institute, consumption continuously increased through the year just past; that production totaled 459,600,000 barrels and that consumption reached an all-time high of 18,150,000,000 gallons with an estimated retail value of $2,459,000,000 exclusive of federal and state taxes. During the past year the consumer paid more than $600,000,000 in gasoline taxes to the various states and the federal tax added another $170,000,000 to this sum; the average price, less taxes, of gasoline was 13.55 cents per gallon.

The past year brought several moves of major importance in management. Significant personnel changes were announced; extensive expansion programs launched; reorganizations effected and at least one company was subjected to a thorough house cleaning.

General Motors brought out its Dealer Council plan; announced a $50,000,000 expansion plan; created a $60,000,000 fund for experimentation in employment stabilization; appointed four important vice-presidents—R. H. Grant, O. E. Hunt, C. E. Wilson and J. D. Mooney—to its executive committee; Fisher Body developed its plan to guarantee jobs and wages to aged workers and Chevrolet brought forth its used car division, the first effort of major importance on the part of car manufacturers to deal with the troublesome used car problem.

Harold Vance and Paul G. Hoffman performed a Herculean task in the rejuvenation of Studebaker, bringing the company out of its receivership, completely reorganizing it and planting it firmly with $5,500,000 of new working capital and announced the establishment of a new assembly plant at Los Angeles. This company introduced an unorthodox innovation in car design; a woman artist, Helen Dryden, was engaged to style the interior of the 1936 President.

The Ford Motor Co. announced an extensive building program, including the construction of a new cold finishing and hot strip steel mill, a giant power plant, new production equipment and increasing capacities of present steel-producing equipment. The company spent approximately $37,000,000

The Governor changes cars and hats and plays no favorites between 1935 and 1936. Upper shows Mr. Smith with Byron Foy inspecting a 1935 DeSoto at the New York Show; the third gentleman is William F. Kinney. Lower, brown derby and all, Mr. Smith and Mr. Kinney learn all about one of GM's new models from William S. Knudsen at the November exhibition

for buildings and modernized equipment.

The trouble within the Hupp organization broke wide open with a series of suits and counter-suits by the Andrews and Drake factions, the latter seeking to wrest control of the organization from the Andrews group and the latter attempting to keep the court-appointed directors impotent in management of the company's affairs. Final settlement came at the annual meeting in September when the Drake forces mustered sufficient stock proxies to control the situation. William J. McAneeny, named president and general manager in December, 1934, quit the job in February and was succeeded by Vern R. Drum. Rufus Cole was replaced as sales manager by Francis Fenn.

Outstanding moves in the Chrysler organization were marked by the elevation of K. T. Keller to the presidency; naming of B. E. Hutchinson to the chairmanship of the corporation's finance committee and appointment of Fred M. Zeder to the vice-chairmanship of the board; a $7,000,000 building program and increasing Plymouth production capacities to 500,000 units.

At Packard, Alvan Macauley, president, rounded out 25 years of continuous service and R. F. Roberts retired as vice-president in charge of engineering, to be succeeded by G. T. Christopher. Graham-Paige appointed F. F. Kishline chief engineer in place of Louis Thoms, resigned, and J. S. Voigt was named assistant to Mr. Kishline.

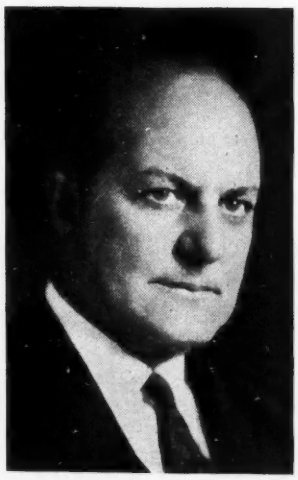
E. J. McCarty, Nash president, one of the first automotive executives to experiment with employment regularization, announced the plan would be continued through 1935, and Charles Nash turned prophetic about show time with a cryptic: "There may be fewer companies in the field when 1936 ends."

Following the death of A. G. Bean, White Motor Co. elected Robert F. Black president. Mr. Black, coming to White from Brockway, found himself in the middle of a strike almost immediately after taking office. The methods and terms of settlement effected by Mr. Black set a precedent for labor-management dealings within the industry, considered by many to be ideal.

Throughout the year management had to meet a continuous stream of changing economic, political and social orders. Chief among these was the complete reversal of operating plans and methods necessitated by the November introduction date. To meet this situation management was forced to cut into operations at one of the best selling seasons, close plants and make extensive alterations in equipment. Distributing methods had to be revised to meet the changed situation and sales plans were forced to a complete readjustment to handle an artificially created buying and selling season.

WILLIAM S. KNUDSEN

General Motors executive vice-president who defended the industry against the charges in the Henderson report; settled the Chevrolet strike without unreasonable concessions and spoke for the industry at the Safety Congress



ROBERT C. GRAHAM

Who led the industry's fight against the Wagner Labor Disputes Act and prophesied a big export gain for 1936 because of reciprocal trade agreements and bettering business conditions abroad

Financially the industry moved to new high ground during the year; few companies reported losses and many were able to completely wipe out losses of the previous three or four years. Significant in the financial picture is the fact that the industry will enter 1936 with working capital resources nearer to the 1929 level than they have been for many years, indicating a considerable increase in current assets and an encouraging downward swing of liabilities.

The year was punctuated with announcements of resumption of dividend payments, declarations of extra dividends, and in some instances increases in then current dividend rates. Several companies announced the redemption of outstanding obligations, principal among these the Chrysler call of $30,000,000 of Dodge bonds and the Murray bond call.

Hudson, needing capital to fortify operations, raised $6,000,000 through the sale of mortgage notes to the Federal Reserve, and Hupp, entangled in legal difficulties, got a $250,000 working capital loan when its receivership suit was dropped.

At mid-year Chrysler announced first-half earnings were 128 per cent greater than for the corresponding period of 1934; made its $7,000,000 allotment for expansion and declared extra dividends for the second and third quarters of the year. Packard reported net profits of $290,460, the first for more than a year, and General Motors' earnings of $83,729,838 were $14,643,225 above those of the similar period of the previous year.

Another effort was made to reorganize Willys-Overland when Empire Securities, Inc., offered 70 for the outstanding bonds and sought acquisition of 67 per cent of claims, the bond offer being contingent upon securing the claims.

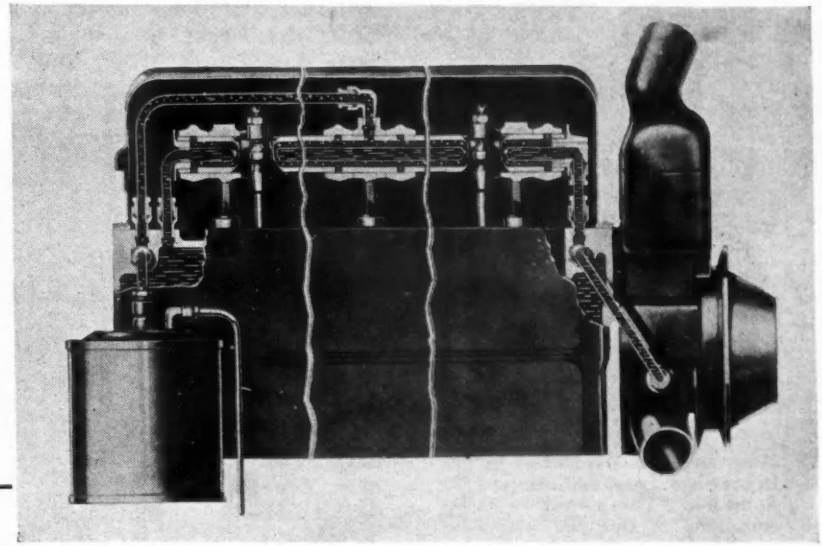
Organized labor within the industry staged a comic opera shadow-boxing bout with management and engaged in a few minor skirmishes, excepting the Chevrolet strike at Toledo and the Motor Products strike at Detroit, the only walk-outs of major importance. At the outset of the year the American Federation of Labor, led by William Green and F. J. Dillon, Detroit organizer, talked a three-cornered strike, automobile, steel and textile, to force through their legislative objectives—the Social Security measure, the Wagner-Connery Labor Disputes bill and the Connery 30-hour bill. While the first two of these were enacted into law, the third failed of passage.

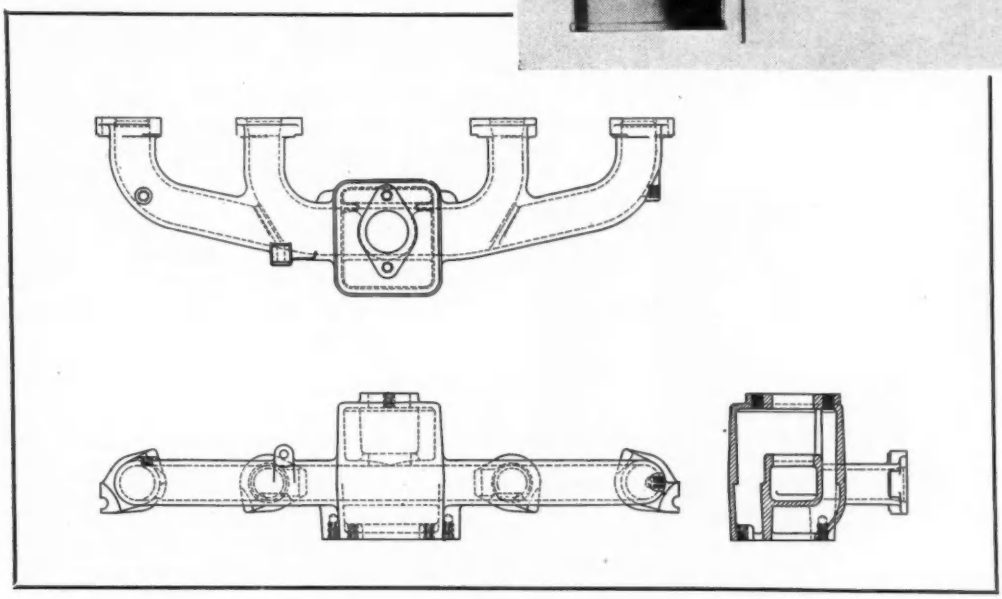
Serious trouble impended upon several occasions when the Automobile Labor Board scheduled collective bargaining elections in various plants of the industry.

Management was afforded some measure of relief when the Supreme Court held N.R.A. invalid in the Schecter decision, but this move launched a scramble for membership among workers by the A. F. of L. and the M.E.S.A. The passing of N.R.A. also brought into the field two large independent groups, the Associated Automobile Workers of America and the Father Coughlin-sponsored Automotive Industrial Workers of America.

Seeking to consolidate their position within the industry and more successfully compete with the A. F. of L. for leadership, the A.A.W.A., A.I.W.A. and a few other more minor groups proposed merging, and at a meeting in Detroit during the middle of December voted the merger.

Labor's frequent charges that the industry discriminated against workers over 40 was disproved many times by analysis of employment records and payrolls. One of the most revealing of these studies and a fair criterion of actual facts relative to this moot subject was the Buick survey. It was





Above: Oil and water circulation through rocker-arm tube in Buick. On left: Pontiac manifold with dams at intermediate outlets

proved that 79.5 per cent of the workers had been employed by the company continuously for five years or more; that average age of workers was 40.003 years, and that of the total number of employees 48.8 per cent were over 40 years of age.

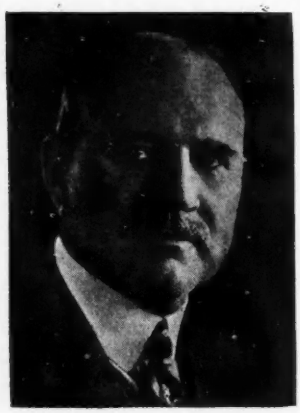
Institution of the November show brought about an almost complete reversal of labor turnover trends within the industry.

The political and legislative outlook for industry at the advent of 1935 was forbidding; bogged with New Deal legislation and experiments, industry moved under a heavy strain. To open the year, President Roosevelt asked Congress to enact an unemployment insurance measure; Donald Richberg, then head of the ill-starred N.R.A., bluntly told industry, and the automotive industry in particular, it had a social and moral obligation to stabilize employment and furnish employment for the then estimated 10,000,000 jobless; the automobile manufacturers' code was due for renewal, and the National Industrial Recovery added further complications by demanding production as an employment aid when the industry was straining every resource to meet consumer demand. The Henderson report of N.R.S.'s survey of the automobile industry was in the offing, and organized labor, as represented principally by the A. F. of L., was demanding passage of the Wagner Labor Disputes Act and the Black 30-hour bill and threatening dire reprisals if these measures failed.

The first political move of importance was the renewal of the automobile manufacturers' code with some minor changes, and this was followed within a week by the Henderson report containing the first suggestion of advancing new model introduction dates as a means of regularizing employment. An analysis of this document proved it full of inaccuracies and not much more than an unconstructive castigation of the industry's supposed labor policies. The report was answered by the industry's leaders, headed by William S. Knudsen of General Motors, with factual evidence clinching the discrepancies found in the report.

Early in the spring Congress received the Eastman Motor Carrier Bill, subsequently enacted into law over the forceful protests of the industry under the leadership of Robert Graham. Passage of this measure brought the trucking industry under Interstate Commerce Commission rule, with a separate division for administration. In June the Supreme Court's decision in the Schechter case knocked the props from under NRA, darling of the Brain Trust, and gave industry some relief from the hampering restrictions and regimentations of the act. The first political utterances from the industry's leaders came when Alfred P. Sloan, Jr., spoke out against the mounting taxes being imposed upon industry, and Henry Ford fired a broadside at the share-the-wealth protagonists they found difficult to answer.

In July the House Ways and Means Committee launched its proposal for a graduated tax upon corporation profits and again Mr. Sloan spoke, flaying the proposal as a penalty upon "business



CHARLES W. NASH

His company pioneered in employment regularization; he prophesied "There may be fewer companies at the end of 1936"

bigness" and charging that the Government did not create wealth, but dissipated it. He followed this criticism with a sound warning against the economic hazards of discriminatory taxation. President Roosevelt signed the Social Security Act at this time, placing further tax burdens upon industry and workers, and the Senate got that brilliant piece of New Deal proposed legislation, the industry licensing measure.

Since the passing of N.R.A. the passage of the Labor Disputes Act was the most important legislation to go on the statute books aimed at control of industry. In the fall Mr. Sloan made his third statement concerning current political and economic problems, emphasizing that the time had come to stop seeking panaceas and playing with "crack pot" theories in an effort to lift the country from its economic lethargy. In October Congress adjourned and shortly afterward President Roosevelt announced his "breathing spell" for business.

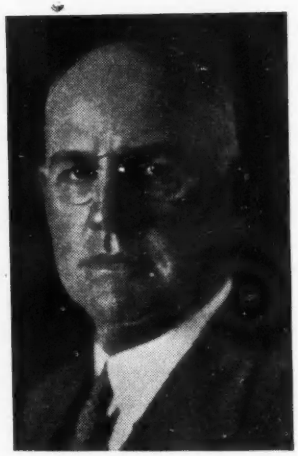
Occupying a prominent place in the industry's activities during 1935 was the safety problem. Practically every company inaugurated safety campaigns within its factories, instructed employees in safety methods and launched a safe driving campaign. The car manufacturers, through the Automobile Manufacturers Association, made large financial grants to the Harvard Bureau of Street Traffic Research for further investigation into the cause of accidents and their elimination, and cooperated with such organizations as the National Safety Council in the promotion of safety education to reduce accident tolls on the highways.

It is regrettable no year can pass without its toll of human lives. During 1935 the automotive industry lost some of its best-known men, among them two of its most colorful personalities. These were John North Willys and Andre Citroen. Other prominent figures were William J. McAneeny, William Hurlburt, who died on the eve of the November show; John R. Lee, A. G. Bean and Neil McDarby.

1936 Finds Used-Car Problems Sharing "Honors" with Profit Search

(Continued from page 10)

tinues in his New Year's statement, "will there be imposed a lowered ceiling upon our future opportunities? To appraise these influences is difficult. I believe timing to be an important factor. If the 'breathing spell' is sufficiently extended to permit the natural forces of recuperation to gain sufficient strength, there will surely be less support for new panaceas and further uneconomic action."



ALVAN MACAULEY

Twenty-five years with Packard and re-elected A.M.A. president, he helped put his company in "the black"

So much for the position of the motor vehicle industry in relation to government, a position which it occupies with many other industries, and in which the point of view of its leading elected executive will find many echoes throughout American industry as a whole.

Without pretending to prophesy, we can pick from the remnants of 1935 certain ideas and tendencies which will loom larger in 1936 and which, because of their prospective importance, seem worth calling attention to now.

For the automobile manufacturing division of the great institution we know as the automotive industry, the first six months of the new year will show the answers to four paramount questions: will production of motor vehicles continue the leveling trend inaugurated by holding the automobile shows last November? Will the used car problem result in a serious dealer mortality and so wipe out some of the gains from the November announcements? Will the labor question be solved with mounting prosperity? Will safety campaigns attain their end, or be so ineffective that further legislative restrictions will descend on the operation of motor vehicles?

To these will be added the answer to a fifth question, as the financial returns from the fourth quarter operations of 1935 begin to come in: Has volume brought profit in proportionate measure? There are positive indications that each of these questions will be answered favorably, but the degree to which they will be answered is still in doubt.

The proportion of payrolls in automobile manufacturing to income from sales has been rising steadily since 1927, and although it has not reached, since 1932, the high point attained in that year, has been consistently above the average for 1927-1932, and the trend is upward.

Partly for this reason, and partly in anticipation of a production increase during 1936, automobile manufacturers and manufacturers whose whole output goes into automobile manufacturing, are spending about $125,000,000 in new plants and re-vampings which will tend to lower the proportion of the labor cost in manufacturing.

Automobile manufacturers, as the year turns, are inclined to maintain manufacturing schedules at the record December level in order to stock dealers for spring consumer buying. There seems, however, no danger of overproduction from this cause, although there is some reason to suspect that overcapacity plantwise may have to be reckoned with later in the year.

February of 1936 may prove to be the critical month in the automobile production program. Schedules will probably be maintained through January (subject, of course, to immediate change), but there are indications in some quarters that stock requirements for spring selling may be met by the end of January and that February will see a strict curtailment of production.

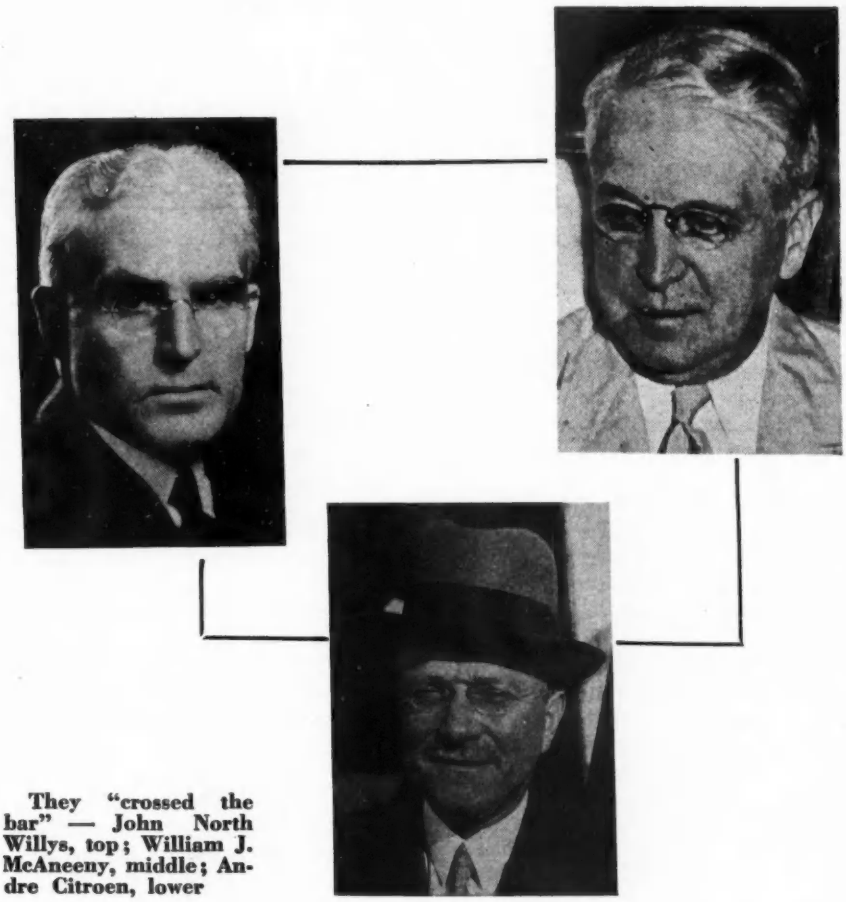
Recovery in truck manufacturing has

been even more rapid than that for automobiles. There is reason to believe, however, that generally lower truck prices have reduced the possibilities for profit in the industry. If volume is maintained in the truck field, it may be necessary to raise prices slightly all along the line. Bus manufacturing seems destined to enjoy a particularly good year in 1936, principally because of municipal buying for the replacement of electric railway equipment.

The number and horsepower of Diesel engines in service on highways in the United States is expected to show a sharp increase during 1936. Some estimates place the horsepower increase at as much as 50 per cent, and with several engines available in the smaller sizes, the number of units may rise above the 50 per cent figure.

The tractor industry seems set for one of the best years in its history. Besides the fact that the Bendix Aviation Corp. is forming a separate marine products division, there are many signs that manufacturers of boats and marine engines will make an aggressive effort to capture more of the "leisure market" in 1936. The development of automotive rail-cars is being accelerated by pressure from the Interstate Commerce Commission for lower passenger-fares on railroads, and the further necessity of meeting competition from automotive-equipped carriers on the highways and in the air.

As an institution, and appraised strictly from the standpoint of normal business improvement, the automotive industry will flourish in many directions during the new year.



They "crossed the bar" — John North Willys, top; William J. McAneeny, middle; Andre Citroen, lower

Determination of Pure Iron Properties Held Industry's Job

SCIENTIFIC research to determine the properties of pure iron should be undertaken by industry, it is declared in a monograph just issued by the Iron Alloys Committee of the Engineering Foundation. This avenue of investigation might lead to results which would exercise a marked influence upon the manufacture of iron and steel. Chemically pure iron has never been prepared in usable quantities, though man has utilized the metal for thousands of years, it is pointed out by the investigators, Dr. H. E. Cleaves, associate chemist, and Dr. J. G. Thompson, senior metallurgist, in the National Bureau of Standards.

The removal of apparently insignificant amounts of impurities may alter the properties of common metals to such an extent that the pure metal resembles a new rather than an improved product, it has been shown by recent research. Thus pure iron may yet be disclosed as something quite different from the metal which has served civilization for centuries.

The Federal scientists indicate that if enough chemically pure iron were obtained to reveal its fundamental properties, it might be possible to effect appreciable economies in the American steel and iron industry.

"The need for reliable fundamental data for iron has developed as a result of the demand for new and improved properties in plain and alloy steels, to meet requirements of constantly increasing severity in metallurgical and engineering service," the study continues. "Alloys to meet these requirements have been developed largely by 'cut and try' methods. At least 12 metallic elements, aluminum, chromium, cobalt, copper, manganese, molybdenum, nickel, silicon, titanium, tungsten, vanadium, and zirconium have been added singly or in combination to iron which already contained more or less carbon, silicon, manganese, sulphur, phosphorus, and perhaps other constituents, in the hope that the resulting heterogeneous mixture would have the desired property or combination of properties.

"If accurate data were available in regard to the fundamental properties of iron itself and the effect of added elements on these fundamental properties, it should be possible, at least to some extent, to substitute calculation for hit-or-miss experimentation in the determination of properties of new alloy combinations."

Publications Received

Report of Committee A-5 on Corrosion of Iron and Steel, American Society for Testing Materials, 260 North Broad Street, Philadelphia.

Report of Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys, American Society for Testing Materials, 260 North Broad Street, Philadelphia.

Report of Committee D-14 on Screen-Wire Cloth, American Society for Testing Materials, 260 North Broad Street, Philadelphia.

Report of Committee B-6 on Die-Cast Metals and Alloys, American Society for Testing Materials, Philadelphia.

The Horizons of Business

By Joseph Stagg Lawrence

Defining the Targets

THE heat of the coming campaign is already in evidence. The candor of the opposition has taken on a militant character. When the present party assumed office the errors of the previous administration and the defects of the prevailing order were not permitted the gentle penalty of obscurity. The bankers, the stock market, the utilities, the airlines, the shipping industry were all placed in the public stocks and their faults exposed by skillful inquisitors for the gratification of an electorate which had suffered keenly during the depression. This electorate craved the human solace which only a sentient scapegoat could provide. How thoroughly an obliging government gratified this desire the record of 1933 and 1934 fully reveals.

More Unemployment

A turn has taken place. We seem to have passed well out of the depression-phase of the cycle. Hope of the future is gradually displacing the disappointment of the past. To exploit that disappointment is no longer a good political trick. What the financiers or the big bad boys of business did or did not do in the twenties is no longer news. The expert mudslingers who had specialized in this form of diversion are in a pathetic plight. Congenitally incapable of constructive action they are virtually without jobs — except that most of them are still being paid by taxpayers.

On the Spot

The fact is that the shoe is very clearly on the other foot. The New Deal adopted a policy of bold experiment. Throwing away all the history books, they embraced schemes upon which the discarded texts could have afforded rich and pertinent references. This defiance of accepted practice became the essence of the new liberalism. The country has tasted the fruits of the "new" theories and—unless the Digest poll is grossly off—has found them unpalatable. Many of these theories, as embodied in legislation, have been vetoed by the Supreme Court. Others have gravely undermined the legitimate interests of large groups of citizens. A number have collapsed under the weight of their own absurdity. Some have fulfilled the expectations of their authors and are a material contribution to the public welfare. In the aggregate they have been costly, have added more than ten billions to the public debt and left the threat of substantially higher taxes to be borne by future generations.

The Pitiless Light

The heat of the coming campaign can be trusted to distill in excruciating detail the mistakes which the New Deal has made. No one who has read our comments from time to time can believe that we hold any brief for the conglomeration of theories and fancies which constitutes the new thought. Yet, in the interest of intellectual honesty, it is necessary to qualify the disapproval and define more clearly the real culprits against whom the censure of detached citizens should be directed.

The government is rapidly, and most unwillingly, assuming the same role toward the New Deal that the leaders of business and finance were forced to play during the honeymoon phase of the present administration. That there may be some ironic justice in this is beside the point.

The Scapegoat

The fact is that the government has become the "fall guy," the scapegoat, for the sins of numerous groups who felt the occasion ripe or the exploitation of their fellow citizens. Last week we recited the tale of silver. Here is a thoroughly mischievous tampering with the currency which has played havoc with Chinese business, which will cost our treasury more than a billion dollars before it is consummated, which will clutter the vaults in the capitol with useless metal and fail utterly to accomplish any of its vaunted purposes.

Naturally, the opposition press is hectoring the Secretary of the Treasury and ringing the changes upon the fallacies of the silver policy now so convincingly revealed. Otherwise loyal democratic papers deplore, without political acidity, the failure of this experiment. It might be supposed that the administration conceived the policy written into the Silver Purchase Act of 1934 or that Henry Morgenthau felt that the Treasury could never be happy until it had accumulated some billion and half additional ounces of silver.

These remarks are not to be construed as a reflection upon the fertility of the New Deal mind. We simply suggest that accurate thinking compels a distinction between the legitimate ideological issue of the New Deal and the numerous illegitimate waifs which were placed upon the New Deal doorstep.

Packages on Doorsteps

Silver is clearly such a foundling. It was accompanied by a note signed by silver representatives to this effect, "Dear Uncle: Treat this brat well or else—" Truculent statesmen called from time to time to see that the instructions were faithfully carried out. The administration did not want the Silver Purchase Act. We think we could make a reasonably accurate guess of Mr. Morgenthau's real opinion of this measure and we are confident that no editorial which the *Herald-Tribune* or the Wall Street *Journal* has ever written on the subject would do that opinion justice.

A Grave Flaw

Here we encounter one of the most serious faults of democratic government. A group becomes conscious of its special interest. It may be the silver miners of the West, the veterans or the potato growers of Maine and Idaho. There is no geographic concentration of pressure groups. These men for the most part believe sincerely that their own interest and the public interest are identical. The silver miner can therefore demand that the government buy silver, which it does not require, at prices which no other buyer pays, with a clear conscience, if not an active faith, that such action will promote the gen-

(*Turn to page* 32, *please*)

JUST AMONG OURSELVES

Used-Cars Pile Up Demand for Aspirin

BEFORE we are fairly into 1936, it becomes increasingly evident that the used-car problem is going to be responsible for many a headache during the early months of the year. In an independent survey conducted during the past two weeks by its correspondents in twenty-five cities, this publication has established factually that stocks of used-cars in the hands of dealers are reaching the critical point, and that unless they are liquidated rapidly, there will be inevitable repercussions on new car sales in the spring.

As dealers awake to the seriousness of the problem, they are becoming more aggressive in their demands that factories shall provide a solution. It has been suggested openly, for instance, that the factories should divert part of the advertising appropriations for spring advertising of new cars to the institutional advertising of used cars sold by dealers, and that bonus plans should be provided for salesmen, to encourage them to dispose of used cars.

Many dealers are beginning "cut-price" sales in an attempt to clear used car stock. This, naturally, has a rather unsettling effect on the used-car market for other dealers and does little to improve the general situation.

Some factories have announced already, concerted merchandising plans to assist dealers in disposing of used cars. Others will probably be coming along within the near future.

One factor which may make considerable difference in clearance of used cars is the possibility of reduction in financing rates sometime early in the year. As noted recently in this publication, the leading national finance companies are studying the possibility of applying the six per cent plans to selected risks in the used-car market, and there is a strong probability that plans will be announced soon.

It isn't the kind of a problem that can be settled with a few pen scratches, and we shall continue to chronicle its developments from week to week.

Instruction Book, With Lots of Kick

DO you remember the old-fashioned instruction books which were an important item of standard equipment with each new automobile? Those were the days when, if an owner lost his instruction book, he wrote to the factory for a new one—he needed it.

The need has not been so apparent in recent years, and instruction books have become a sort of vermiform appendix to the factory promotion job. Notable recent exceptions have included a little four-page folder included with new Ford cars.

Now, however, Pontiac comes through with a new booklet prepared under the direction of H. G. Weaver, able director of G. M.'s Customer Research Division. Mr. Weaver has thrown aside most of the traditional ideas which have gone into many a dull instruction book and turned out something which every owner will probably be glad to read.

The result will be a lot of Pontiac good-will built up through present ownership, for which Mr. Weaver's booklet answers a lot of questions. Everything about the book is human, including the "technical" data on Pontiac features—and what to do with the upholstery if your dog isn't a gentleman.

Fleeting Chance Of Spring Models

IT is no news by now that few radical mechanical changes were made in American passenger automobiles for 1936. As this fact has percolated to observers outside the automotive industry, it has brought in several cases guesses that the car manufacturers must have something up their respective sleeves which would be sprung suddenly should spring sales take a downward turn.

So far as we can learn at this time, there is nothing substantial to back up such guesses. Pattern makers who should know say there is no unusual activity, except that which inevitably surrounds new-model experiments far in advance of production. The outward fringes of January, however, may show something concrete in the way of tentative new models.

Our own guess, subject to amendment, is that automobile manufacturers are still planning for new-model announcements next November, and that interim announcements would prove to be too expensive, in most cases, to justify the effort.

—H. H.

Dodge Trucks for 1936 Cover Half

THE Dodge truck line for 1936 will consist of ½-, ¾-, 1-, 1½- (two series), 2-, 3-, and 4-ton models. Specially built custom airflow models will also be offered. Among the improvements made in the line is a shifting of the loading area forward relative to the axles, and smoother body lines. Panel bodies, with the new sloping rear-end contuor, are especially attractive.

The ½-ton truck now has a heavier frame of the double-drop type with five substantial cross members, including the rear engine support. For the commercial sedan the Dodge Company uses its passenger-car body to assure passenger-car riding comfort.

Doors of all 1936 trucks and commercial cars are hinged at the front. Amola steel, a recent metallurgical development of Chrysler Corporation, which has a high endurance limit, is used in the springs of the entire line.

The ½-ton commercial-car series has a 116-in. wheelbase and replaces the 111-in. and 119-in. wheelbase models of the 1935 line. By shifting the engine and cab forward, the distance between the rear of the cab and the rear-axle center has been increased to 37 11/16 in., which permits of the use of a 75-in. express body with good load distribution. This model is powered by a six-cylinder 3⅛ by 4⅛-in. engine of 70 hp. Frame side members are 6 in. deep and cross members are of box section. The design of the clutch and brake-pedal mechanism follows that on the 1½-ton truck. A 10-in. clutch is used, equipped with a ball-bearing clutch release with provisions for lubrication. The spare tire carrier is mounted on the side of the frame just forward of the cab door. The four-wheel hydraulic brakes, with stepped-bore wheel cylinders, act on 10 by 2-in. drums. Transmissions are of the three-speed synchro-silent type, and a choice of rear-axle ratios ranging from 3.7 to 4.1 is offered. The standard tire size is 6.00 by 16.

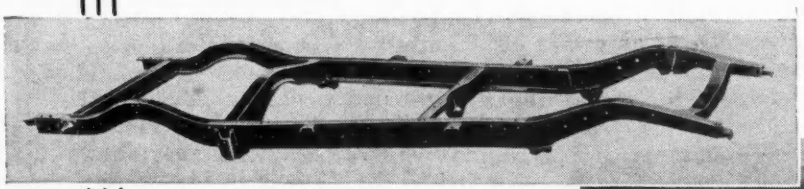
Models offered in this series include a flat-faced cowl, cowl with windshield, cab, panel, screen, canopy and express and station wagon. The Commercial sedan is built on the Dodge passenger-car chassis. The express box, of all-steel construction, is 72 in. long, 47½ in. wide, and 17 in. high.

The 1½-ton models are furnished in 129-in., 136-in. and 162-in. wheelbase lengths and in two series of 9500 and 11,500 lb. gross rating. The 9500-lb. gross, 1½-ton chassis carries a six-cylinder engine of 3⅛ by 4⅜ in. bore and stroke, with 201.3 cu. in. piston displacement, which develops a maximum torque of 138 lb.-ft. and a maximum power output of 70 hp. This model carries a 10-in. clutch, with ball bearing clutch release and provisions for easy lubrication, and a four-speed transmission.

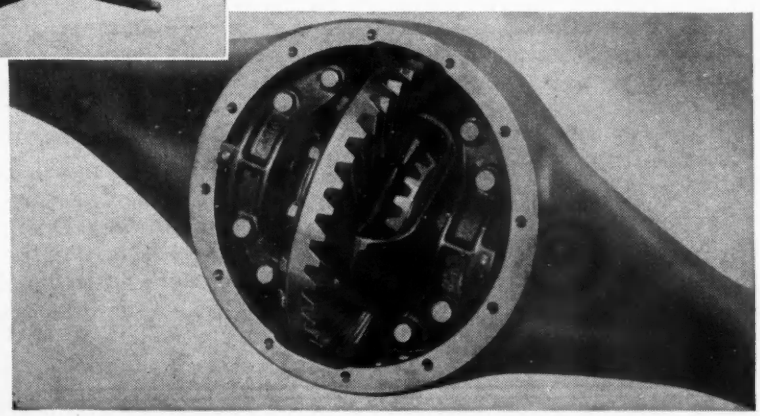
The rear-axle housings of Dodge 1½-ton trucks represent a new development, being made of one piece of seamless steel, expanded at the center to receive the differential carrier, and contracted at the ends for mounting the wheel bearings. The combined brake support and spring seat is electrically welded to the housing, after which the entire housing assembly is heat treated. Full-floating construction is used.

The standard rear axle ratio is 5.428 to 1; optional ratios of 5.8 to 1 and 4.875 to 1 are being offered. Other features of this model include a frame with 7-in. side rails and heavier cross members, and hydraulic brakes acting on 14⅛ by 1¾-in. drums with stepped-bore wheel cylinders. Standard models offered include a flat-faced cowl, cowl with windshield, cab, panel, screen, canopy, express, stake and platform.

Specifications of the 11,500 lb. gross,



New double-drop frame of the half-ton commercial car



Center part of new full-floating rear axle with one-piece steel housing. The differential carrier can be taken out through the front

to Four-Ton Range in Two Series

Dodge 1½-ton canopy truck on 136-in. wheelbase

1½-ton models include a six-cylinder engine of 3¼ by 4⅜-in. bore and stroke, with 217.7 cu. in. displacement, giving 150 lb.-ft. maximum torque and developing 70 hp. The differential carrier assembly and housing are of heavier construction. Axle ratios available are 5.125 to 1, 5.66 to 1 and 6.33 to 1. Front brakes are 14⅛ in. in diameter and 1¾ in. wide, rear brakes, 16 in. in diameter and 2½ in. wide. The frame, side rails and cross members have been strengthened. Standard models include a flat-faced cowl, cowl with windshield, cab, stake and platform.

The 2-ton models have a gross weight rating of 13,500 lb. They are available in 136-in., 151-in., 162-in. and 180-in. wheelbase lengths. This truck is powered by a six-cylinder engine of 3⅝ by 4½-in. bore and stroke, of 241.5 cu. in. displacement that develops 170 ft.-lb. maximum torque and 85 hp. Other features include a heavy-duty, 11-in. clutch with torsional spring damper, ball-bearing clutch release, with provision for lubrication, and a five-speed transmission with a silent fourth speed. The rear axle is full floating and is offered in ratios of 5.125 to 1, 5.66 to 1, and 6.33 to 1. A double-reduction axle with a ratio of 7.35 to 1 is also available as extra equipment. Hydraulic brakes, booster-operated, of 16-in. diameter and 2½-in. width, are standard equipment. Brake lining is ¼-in. thick and fastened to the brake shoes with large rivets. The frame has an increased number of cross members. Standard types offered for this chassis are a flat-faced cowl, cowl with windshield, cab, platform and stake.

Dodge will continue to offer 3- and 4-ton models and the special custom-built Airflow types recently introduced.

New Lamp Improves Visibility in Fog

THIS season saw the introduction of the "fog cap" headlight bulb which is said to improve visibility when driving in fog or rain. The shielded bulbs are a product of General Electric Co., and are now available in the following range of styles:

Mazda No.	Bulb	Volts	Candle-power	List Price
1000 S*	S-10	6-8	32-32	$0.28
1110 S*	S-10	6-8	21-21	.27
1116 S*	S-10	6-8	32-21	.28
2320 S*	‡RP-11	6-8	32-21	.38
2330 S*	‡RP-11	6-8	32-32	.38

‡ Fitted with D. C. bayonet base with prefocusing collar.
* Shielded bulb.

Shielded bulbs differ from conventional types in that there is an opaque coating on the end of the bulb that masks most of the direct rays which normally do not strike the reflector. By shielding most of the direct rays, spilled or scattered light is reduced, thereby improving visibility when driving through a hazy or foggy atmosphere. While the shielded bulb does not reduce glare from the main driving beam, it minimizes annoyance from scattered light, thereby making headlights more comfortable to the eye when viewed at close range by approaching motorists.

Serious glare is produced by improperly adjusted headlight beams. The shielded bulb neither eliminates the necessity for proper headlamp adjustment nor the need for depressing beams when meeting other cars.

General Electric shielded bulbs are coated with black glass enamel which is fused to the bulb. The coating is permanent. It will neither flake nor peel in service.

An Open Letter to

ALFRED P. SLOAN, JR.

President, General Motors Corp.

A CHILTON Publication

Automotive Industries

CHESTNUT AND FIFTY-SIXTH STREETS · PHILADELPHIA · PA

December 30, 1935

Mr. Alfred P. Sloan, Jr.
President, General Motors Corp.
1775 Broadway
New York, N. Y.

My dear Mr. Sloan:

In your New Year's message directed to the American public, discussing the flood of panaceas and uneconomic action which have descended upon the land you say: "I am hopeful that, as conditions improve, we will intelligently appraise that type of thinking....and reaffirm the principles and policies upon which American industry is founded".

Several months ago the Chilton Co., publishers of AUTOMOTIVE INDUSTRIES and a score of other periodicals in the business field, decided that the way it best could serve its industrial public in 1936 would be through an intelligent, aggressive reaffirmation of the principles you mention.

The New Year finds us prepared to go forward with such a program, which will have for its general title "The American System of Enterprise".

In subsequent issues of AUTOMOTIVE INDUSTRIES, and in all the other publications of the Chilton Co. -- The Iron Age, Automobile Trade Journal, Commercial Car Journal, Dry Goods Economist, etc., etc. we shall present regularly to American business a formulation of the principles upon which its prosperity of the good years has been founded.

To the end that this effort shall be directed and coordinated intelligently, we have established the Chilton Bureau of Economic Research, of which the findings will be available jointly to the editors of our publications and to the publics they serve.

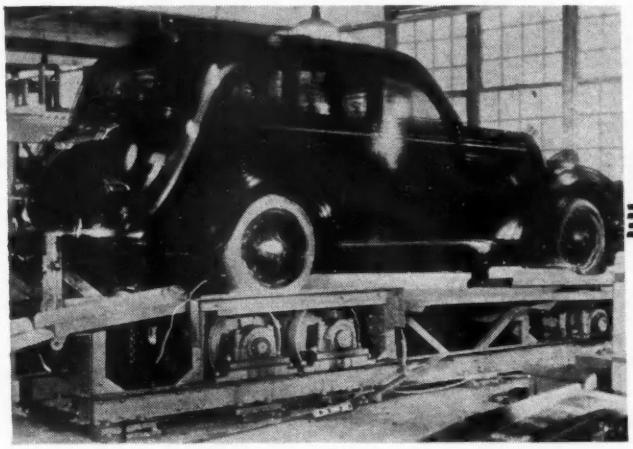
We believe that government participation in business should be diminished to the minimum consistent with the public interest under a democratic form of government; that taxes which penalize private enterprise should be reduced or abrogated; that American labor should share with employers the right to free bargaining and that sumptuary laws which interfere with reasonably free economic expression should be written off the statute books. To these ends and all others which have come to be regarded as traditionally American we pledge our support.

Sincerely yours,

Herbert Hosking

Herbert Hosking/eh

Editor
AUTOMOTIVE INDUSTRIES



PRODUCTION LINES

In the scene pictured here, a new Dodge is undergoing "punishment pit" treatment of the Belgian Roll, a contrivance to subject cars to machine-made wear and tear of such concentration that a single day's mechanical torture is the equivalent of years of the most strenuous actual service

Mostly Automotive

The role of grinding in the automotive field is covered rather comprehensively in the current issue of *Grits and Grinds*. In fact the whole issue is devoted to this subject. They cover some of the very latest items of equipment, and single out a large group of tricky grinding operations. A separate section is set aside for the service industry. Let us know if you want a copy.

Bearing Bronzes

The Copper Development Association (CDA) of London is continuing a flow of technical bulletins that are gems. The latest one is called "Bearing Bronzes" and deals with the development of bearing materials in Britain. One section is devoted to their practice in copper-lead bearings while another section takes up the manufacture of bearing bronzes from metallic powders. This, by the by, is a valuable new technique which hasn't had enough publicity in this country.

Soft Roof

It's interesting to note that the construction of the soft roof has undergone a radical change from former practice. Formerly, the whole section was assembled as a complete unit and set into the roof opening on the trim line. Now the entire operation is handled along the assembly line. You can see this at Packard and Dodge truck.

Worker Comfort

That worker comfort is being considered more and more in automotive plants is a matter of common knowledge, at least among those concerned with production. An interesting example may be found at the Dodge truck factory. From time immemorial pneumatic or hydraulic riveters have been used on the frame assembly line and the racket is nerve racking to say the least. Today the Dodge truck management is installing a new type of pneumatically operated squeezer which heads the rivet with just one movement. No more noise, no more headaches. Incidentally, these squeezers are replacing riveters which have not outlived their usefulness from a purely physical sense.

Try Out

Knudsen told a dramatic story recently about the things that took place when the new six-cylinder Chevrolet line was placed in production several years back. Here was an entirely new powerplant and chassis. Yet they had to get under way in a big way in a hurry. Millions of dollars of new equipment had to be installed and they couldn't afford to make a false step. Under Knudsen's direction, they set aside a small department into which were set-up one of each of the new machines. Then they went to work on a small scale to produce the new line. Changes and improvements were undertaken right on the spot and when it was time to shoot the new line, they were all set.

Build Keymen

With an ear to industry's needs as exemplified by W. S. Knudsen's recent talks, the Policyholders' Service Bureau has published a comprehensive study appropriately entitled, "Training Supervisors and Key-Men." It deals with the vital question of properly preparing foremen and shop executives for their function as industry's first point of contact with the workers. The discussion centers about the best methods of training the foremen, with emphasis on the conference method. A separate section is devoted to the plans adopted by General Motors, International Business Machines and other large organizations. Here is a valuable manual for everyone concerned with management. We shall be glad to get your copy.

Open Sesame

There is no finer example of the open door in the auto plant than at Plymouth under the inspiration of "Pop" Saurbrey, manufacturing vice-president. We were called there several days ago to see some new equipment representing ideas that are novel and unusual even in this industry. They are the kind of developments that ordinarily would be kept under cover for a long time. But the master mechanic's department is willing to have the industry know what's going on. Here's for more and more of the same spirit.

For Flywheels

Plymouth has just started a battery of two Gisholt lathes tooled for the finishing of iron flywheels. It's said to be the first installation of its kind. Two machines with one operator turn out more work per hour than a battery of three heretofore. Complete details will be found in AUTOMOTIVE INDUSTRIES in an early issue.

Grinds Bearings

Will wonders never cease! We have seen a big grinder set up to finish the four camshaft main bearings in one setting, at the rate of over 100 shafts an hour. It has four wheels operating simultaneously. More of this when the job is ready. —J. G.

MANUFACTURING MANAGEMENT METALLURGY

The FORUM

Experience on the Use of Butane

Editor AUTOMOTIVE INDUSTRIES:

Much of the published data regarding use of "butane" has been of a promotional or enthusiastic nature, and has resulted in comparisons on totally unwarranted bases. For example, claims have been made of phenomenal improvements in mileage and reductions in maintenance costs; also of great reductions in fuel costs. Our belief has been that such comparisons have often been on the basis of converting from poor carburetion to good carburetion, crediting "butane" for improvements that could have been obtained with gasoline itself; and on abnormally low costs of butane which can prevail only in restricted areas. Our concern has been to establish, to our own satisfaction, the possibilities of this fuel in strict competition with gasoline.

We have attempted to compare "butane" and gasoline on the basis of best possible operation on each fuel. With this in mind, we last year incorporated five vehicles, adapted to use liquefied gas, among new equipment then being purchased. Four of these are 2000-gallon (nominal) CJ Mack "camel back" units, which were placed in service under the same conditions and at the same time as four corresponding new units operating on gasoline. The remaining unit is a White tractor-trailer unit, grossing about 33,000 lb. In the latter case, also, a corresponding new unit was placed in identical service at the same time, operating on gasoline. Since these vehicles have been in operation we have attempted to maintain service conditions of the "butane" and gasoline units as nearly identical as possible.

Conversion of the units to butane was left entirely in the hands of the manufacturers, they being asked to equip the units for the greatest possible gain, from the standpoint of both compression ratio and manifolding. The Mack engines were equipped with special 7:0 : 1.0 heads and with special, large, cold manifolds. The White engine was supplied with the Ethyl-Gas head and standard manifold with, however, the hot spot blanked off. Butane equipment was supplied completely by one of the leading manufacturers on the West Coast. Before going into service, carburetion on all vehicles was checked by means of the Englehard Analyzer and by actual power tests, and such check has been maintained at regular intervals. The following tabulation compares the vehicle specifications of interest in the present connection.

	MACK		WHITE	
	"Butane"	Gasoline	"Butane"	Gasoline
Model	CJH	CJ	5-642	642
No. cylinders	6		6	
Bore and stroke	4¼ x 5½		4⅝ x 5¾	
Displacement	468		580	
Compression ratio	7.0	5.2	5.6	4.6
Carrying capacity (water weight), tons	9.8		18.75	

Pertinent results and experience to date in operation of these vehicles may be summarized in the following sections.

Fuel Used

Since our operations have extended through both winter and summer, it has been necessary to increase propane content under cold weather conditions. The normal fuel used on the West Coast and by us at temperatures above about plus 20° F. is approximately 80 per cent butane (both normal and iso -) and 20 per cent propane. At temperatures between minus 10° F. and plus 20° F. it has been necessary to increase the propane content to 50 per cent. This, of course, means, for Eastern and Mid - Western operation, either two grades of "butane" are required, or the storage equipment must be designed for higher pressures in the summer time than has been the case on the West Coast. Higher propane contents than 50 per cent will probably be required for temperatures below minus 10° F.

Mileage

We have to date had rather disappointing results in mileage obtained. We have compared mileage results on the basis of heat contents per *gallon* of the fuels used, taking as a basis the *low* heating value *plus* latent heat of the fuels. The following tabulation, representing the average of nearly a year's operation, gives the mileage of the "butane" equipment as a percentage greater or less than would be expected on the basis of heating value per gallon. Recall that to *equal* gasoline the 80/20 mixture should show an improvement of approximately 17 per cent and the 50/50 mixture approximately 20 per cent. Gains are of course due to better carburetion and to the higher compression ratios used.

Mileage, Compared to that Expected on Basis of Heating Value Per Gallon

	Mack	White
80% butane, 20% propane	—12.1%	+5.1%
50% butane, 50% propane	—14.0%	+3.0%

It is necessary to explain here that the White unit is on heavy duty, long haul service, while the Mack units are on urban delivery, with many stops and starts and relatively low daily mileage. This is not by any means a criticism of the Mack equipment; on the contrary, the excellent fuel economy of these units under the service conditions certainly contributed to the poor showing of butane.

We realize fully how poorly these results compare with much published data, but have been unable with the present equipment to improve mileage by any means at our disposal. We are now installing different carburetion equipment, involving economizers for part load operation, with variable venturis to correct losses at idle and during overrunning, and have reason to believe mileage will improve considerably. It is a fair conclusion, however, that with ordinary regulators and plain tube venturis it is difficult to equal gasoline mileage with butane, particularly under light load, frequent stop conditions, when comparing with well maintained and operated modern gasoline equipment. There are more complications and "tricks" connected with efficient butane carburetion than the casual reader of published information may be lead to anticipate.

Performance

Road performance of the butane equipment has been, in the main, highly satisfactory. Pulling power in high gear is definitely better, with fewer gear changes; acceleration is better under governor control; the units in general have more "pep" than the gasoline units under identical conditions. Certain difficulties, largely mechanical, have been encountered, however. Starting has been rather difficult, although we believe now this can be corrected with means to induce lower venturi pressures at cranking speeds. Regulating valves have plugged or stuck on occasion, due either to dirt or to moisture freezing under winter conditions. Gas leakage, from the secondary regulating valve, has caused several minor under-hood fires. Stalling has been experienced in sub-zero weather, due to inadequate vapor pressure.

Lubricating Oil

Lubricating oil condition on the butane vehicles has been highly satisfactory. While we have not as yet fully completed our tests in this regard, present indications are that considerably longer draining intervals may be used with butane than with gasoline, without excessive acidity development. Dilution is, of course, negligible. Lighter-than-normal lubricating oils are not only possible but, in many cases, necessary, with butane.

Mechanical Conditions

We have, of course, had various mechanical troubles incident to our initial operation of butane. Most of these can be blamed on inexperience. Certain difficulties are, we believe, characteristic of butane operation. Despite its exceptionally high octane number, butane will detonate at high compression ratios, and is quite critical to spark advance. Butane is also more prone to preignition, and it has been necessary to use exceptionally cold spark plugs to eliminate repeated failures of head gaskets. There is also a tendency to pitting of exhaust valves under the lean mixtures necessary with butane to obtain best mileage. There are certain other mechanical features under observation, concerning which we are not prepared as yet to comment.

G. H. FREYERMUTH,
Engineering Division, Lubrication Department, Standard Oil Co. of N. J.

The Case for Shorter Engines

Editor, AUTOMOTIVE INDUSTRIES:

In regard to my letter "Shorter Engines for Streamlined Cars" in the Aug. 3 number and the consideration of it in the letter "Engine Types for Rear Mounting on Passenger Cars" by Glenn D. Angle in the Aug. 24 number, I have been away from San Diego and did not receive the latter number until a few days ago. Otherwise, I would have replied sooner.

I read Mr. Angle's letter with much interest and appreciation. However, in my letter, I was not arguing in favor of either front- or rear-engine location. I was arguing for shorter engines, in whichever location they are placed. Certainly, a manufacturer can not put the engine farther and farther ahead in order to allow more slope to the rear of his car's body without effecting most unsatisfactory weight distribution, and if the engine is to be placed at the rear, the overhang behind the axle must be kept down also in order that good weight distribution will result.

In considering radial engines for rear-engined cars, I had in mind the engine located behind the axle in a tilted position, the front end of its crankshaft being lower than the rear end. Such mounting conforms well to the broad sloping rears of most present streamlined body designs, and it is of interest that it is favored in the projected design of an ideal streamlined car by the French manufacturer, Voisin. Worm drive works out well with such mounting, the worm being ahead of the engine and above and somewhat ahead of the differential and ring gear, and the engine would be sufficiently accessible.

In regard to engine position in rear-engined cars, I call Mr. Angle's attention to the fact that the Mercedes-Benz and the Crossley cars of such type have their engines so mounted that their crankshafts are horizontal or practically so. Radial engines might well be used in place of those cars' engines but for the downwardly extending cylinders.

Mr. Angle's proposal to mount a radial engine at the rear with its cylinders in a horizontal or nearly horizontal plane is rather radical but interesting. It recalls to my mind the Adams-Farwell five-cylinder air-cooled rotary-engined car of nearly 30 years ago, and also a British car design, the North-Lucas, I believe, of about 13 years ago, in which a rear-mounted radial engine was embodied. As I remember the latter design, the engine cylinders were either in a horizontal plane or nearly so, and worm drive was used. Whether or not the design resulted in actual construction, I do not know. The only other radial-engined car of which I know, if those having vee engines are not to be so-called, was the British Alldays and Onions, according to my memory, with a radial air-cooled engine mounted high in the front end of the car, made in England shortly after the World War, except for a racing car of largely similar design now being experimented with in Europe by a certain Count Trossi.

It is true that a radial engine mounted as Mr. Angle proposes avoids downwardly extending cylinders, or, if tilted slightly, reduces their downward extension to such an extent that it is not objectionable, and it would allow a sump in its lower crankcase cover. However, if placed sufficiently low in the chassis to effect a low center of gravity, it allows very little room for a flywheel, clutch, and gearbox, although the flywheel could be inside the crankcase or at the upper end of the crankshaft. The engine itself would be fairly accessible, but the clutch housing and gearbox would have to be got at from underneath the car, as a result of the overhang of the cylinders. Also, the driveshaft from the gearbox to the axle would be extremely short, which would be hard on the universals and sliding connection. It would be possible, however, to bolt the whole powerplant unit directly on to the differential housing, thereby eliminating universals and a sliding connection, and to secure the powerplant and differential unit to the frame of the car, using independent rear wheel suspension probably of the type used at present by Mercedes-Benz in Germany and Delaunay-Belleville in France. The use of worm drive would allow a low powerplant location.

In regard to the R. E. P. engines of which I wrote, I saw several of them

at the Esnault Pelterie factory in France in June, 1912, during a visit that I made to that establishment, and I was under the impression that the five-cylinder one had two cranks at 180 deg., as the seven-cylinder one had. That was a long time ago, though, and my memory may not be accurate about the matter. Anyway, either five or seven or any greater odd number of cylinders would fire at equal intervals of crankshaft rotation with such a crankshaft. I suggested the use of the R. E. P. or "fan" type of engine cautiously, as I am aware of its balancing difficulties. I believe that its balance could be much improved and possibly made sufficiently satisfactory by means of certain rotating devices (of which I may have more to write later on) in addition to the usual crank counterbalances. If such a result were attained, that type of engine certainly would be of interest with regard to streamlined car design, whether the engine were located at the front or at the rear. If a four-throw crankshaft such as is embodied in the conventional four-cylinder engine, were used with four banks of cylinders, rocking couples would be neutralized, and the engine would still be short enough for front location even if too long to be located at the rear. With such a crankshaft, R. E. P. type engines could be made with six, ten, fourteen or more cylinders. It seems likely that the ten and fourteen cylinder engines recalled by Mr. Angle were of such design.

Vees Easy to Balance

It is of interest that the engine with which Louis Bleriot first flew the English Channel in 1909 was of the three-cylinder W type, like one bank of cylinders of the R. E. P. type. Also, about 25 years ago, a model of the Curtiss motorcycle having such an engine was manufactured. In regard to vee engines, the great number of twin cylinder vee motorcycle engines that have been and still are manufactured are demonstration of the fact that a fair balance can be effected in that type with nothing more for balancing than a pair of crank counterbalances. The performances of the Lion-Peugeot twin cylinder vee light racing cars in 1910 are still further evidence, and the engines of those cars had abnormally long strokes. It is a well-known fact that the 90-deg. vee twin balances very well. It probably would have been more widely used by motorcycle manufacturers but for its very unequal firing intervals, resulting in uneven torque at low speeds and ignition difficulties with use of magnetos.

I do not, however, mean to be taking any determined stand in favor of R. E. P. type engines. I merely suggested the type for consideration. I do adhere to my view, though, that shorter engines than those of present conventional types are desirable if we are going to have streamlined cars with proper weight distributions, and so long as we use the four-stroke type of engine, the only way to accomplish the result is to develop desirable radial or fan or more complex vee types for automotive purposes. It may be concluded eventually that the Napier Lion W type of twelve-cylinder engine would be the most satisfactory. It is short for its power output and is one of the most successful aviation engines ever made. Probably its rows of cylinders could be brought closer together to narrow it, as the resulting unequal firing intervals would hardly be noticeable in torque effect with an engine having so many cylinders. An advantageous effect of the unequal intervals would be to prevent torsional crankshaft vibrations. Such an engine is probably most appropriate for front location, as it is rather long for locating at the rear, but it is short enough so that if mounted at the front but as far back in the frame as the car's body will allow, the center of gravity of the powerplant unit can be considerably farther back than where it is now with conventional six, straight eight, and twelve-cylinder vee engines. The W type twelve-cylinder vee engine is shorter than the conventional vee eight, too, due to the former's smaller cylinder bore, which also is advantageous.

I believe there was no time since the early days of the motor car when its future design was more in doubt than it is now as a result of the desire to reduce atmospheric resistance. Often I have felt that the future design would inevitably be one with the engine at the rear. Panhard's reason for first locating the engine at the front, viz., accessibility, is no longer of such great importance as it was in the early days of development, and modern streamlining certainly makes rear location allurring. An engine at the rear would hardly be more inaccessible than it is in the most streamlined of American cars, the De Soto and Chrysler "Airflow" models, anyway. However, apart from the question of desirable engine type for such location, in addition to the objection of inaccessibility, there are various other objections. Here are some of them listed for consideration.

1. With rear drive, the short distance between the engine and the differential housing, in which distance the clutch, gearbox, and driveshaft with its universals and sliding connection must be located, the result being rapid wear of the universals and sliding connection (this, unless the powerplant and differential housing are in one unit and independent rear-wheel suspension is used, as previously described in this letter). The gearbox would have to be very short. If such transmission devices as the "fluid flywheel" and the Wilson or the De Normanville planetary gearboxes, in successful use on several prominent British cars, were desired, the congestion would be still more serious. Of course, plenty of room for the gearbox can be provided by locating it ahead of the engine, preferably somewhere near the middle of the car, the drive being from the engine to it by a long shaft and from it back to the axle by a conventional universally jointed shaft, but this requires driving through two sets of gears on all speeds, one of them being in the gearbox and the other in the rear axle. An alternative to the latter design is to drive by the front wheels, in which case it probably would be preferred to locate the gearbox at the front of the car and drive from the engine to it by a long shaft.

Location of Fuel Tank

2. Desirable location of the fuel tank with regard to danger of fire. If placed at the rear, it would be very close to the engine and likely to cause fire in rear end collisions. If placed at the front, it would be vulnerable in front end ones. It could, of course, be placed in the cowl as has so aften been done, or under one of the seats, but its presence anywhere ahead of the engine could be dangerous in an accident.

3. Possibility that, in case of head-on collision, the engine would tear loose from its supports and crash forward through the car. The flexible rubber mountings now generally used would make this result all the more likely.

4. Almost complete elimination of heating of the interior of the body from heat radiated directly by the engine. This effect, while desirable in hot weather would result in cold driving during cold weather, unless interior heating were provided. There would be some heating effect from the radiator if it were placed in front but not enough for comfort in wintertime.

5. Long control mechanism extending from the pedals, levers and dash, under the body, to the powerplant unit (with the gearbox located centrally or at the front, its particular operating mechanism would not be objectionably long).

6. If the radiator is at the front, long tubes connecting it with the engine.

7. With front radiator location and rear drive, the difficulty of driving the fan (if front-wheel drive were used with the gearbox at the front, the fan

could be driven from the main drive-shaft. It could be driven by a belt from a pulley at the front end of that shaft if worm drive were used.).

These considerations make me wonder whether or not, after all, rear-engine location is desirable. I cannot agree with the view that such design must at the present time necessarily be recognized as superior. I regard its merit to be, at the most, still doubtful.

STANLEY B. ARNOLD

What is Ideal Surface for Cylinders?

Editor, AUTOMOTIVE INDUSTRIES:

Have any tests been made in the United States, either in the laboratories of automobile factories or on race tracks, to determine in what way and to what extent the smoothness of the cylinder wall affects the performance of internal combustion engines?

What we mean is, has it been proved experimentally or practically whether a very smooth surface of the cylinder wall possesses any advantages or has any disadvantages, and what are these advantages or disadvantages? It is, of course, possible that an extremely high finish of a cylinder wall has no practical advantage whatever.

In case no practical or experimental tests have been made on this subject, will you kindly inform us whether among automobile engineers in your country there is any definite opinion as to what constitutes an ideal surface for a cylinder wall.

SVEA BILWERKSTAD,
Stockholm, Sweden.

It is only a short time since it became possible to determine the degree of smoothness of a surface experimentally, and we have heard of no tests specially made to determine the effect of variations in smoothness of cylinder wall on engine output, blow-by, oil consumption, etc. The general assumption undoubtedly has been that the smoother the bore the better, although recently some opinions to the contrary have been expressed. We should like to hear from any of our readers who may have experimental evidence or definite opinions on the subject.—*Editor.*

Automatic Transmission at Olympia

Editor, AUTOMOTIVE INDUSTRIES:

Dear Mr. Chase,

I was much interested in Mr. Bourdon's account of the Olympia show in your current issue of AUTOMOTIVE INDUSTRIES. I notice, however, in his paragraph on transmissions that although he mentions synchromesh and the Wilson gear box and goes on to state that Austin uses a 4-speed box with synchromesh on three speeds, he fails to mention the Hayes Selfselector Automatic Transmission which Austin is offering again this year as special equipment on the 16 and 18. As a matter of fact, this transmission was the most prominent feature of Austin's exhibit on their chassis stand where they showed a complete 18 hp. chassis equipped with this transmission and cut away to show it in operation, and, in addition, a cut-away working exhibit of the transmission itself driven by an electric motor and arranged for hand operation of the ratio control. As in the last two years, this exhibition was one of the principal attractions of the show. Since this transmission is the most advanced solution of the transmission problem, giving, as it does, an automatic and infinite variation of ratio from low up to an overdrive, and happens, in addition, to be an American invention, I think a large section of your readers might be interested in some mention of it.

FRANK A. HAYES

Advocates Small Dual Belts For Fan-Drives on Buses

THE use of small dual instead of large single belts for fan drives on buses was advocated at a recent meeting of the Central Transit Equipment Association by Henry L. Debbink, superintendent of gasoline vehicles of the Milwaukee Electric Railway and Light Company. The chief reason for inadequate life of the large belts is that the diameters of the pulleys are not large enough. For instance, a 1-in. belt should not be run on pulleys of less than 9 in. diameter, whereas the fan pulleys on buses often are only 4-6 in. in diameter. In an installation in the service of the Milwaukee company, dual belts of 11/32 in. width gave an average life of 60,000 miles, as compared with 25,000-30,000 miles for a single 1-in. belt. An additional advantage of dual belts in bus service is that if one belt breaks it need not cause a delay on the road, as the fan can be kept running with the other one. In 1932 a large proportion of all road delays of the company's buses was found to be due to the "cooling system" and it was found that 59 per cent of these "cooling system" troubles consisted in fan-belt breakages. Since then fan belts are closely inspected every 1500 miles, care is taken not to over-grease the fan pulley and to keep grease off the belt, and single belts have been replaced by dual belts on many coaches.

Appointment of M. A. Hollinshead as vice-president in charge of radio activities for Campbell-Ewald Company of New York, Inc., has been announced.

Cause of Uneven Cylinder Wear

Editor, AUTOMOTIVE INDUSTRIES:

Regarding uneven wear of engine cylinder walls, it is very evident that uneven temperature throughout the cylinder body is one cause. This is axiomatic from the law of heat and expansion.

Theoretically, no two points on a cylinder wall operate at exactly the same temperature. The combustion end of the cylinder is hotter than the other end, or any point between. Ribs, flanges, and bosses, affect the temperature at "spots." and subsequently the expansion of the cylinder wall.

A "cold spot" in the cylinder wall, such as is produced where the cooling water enters the water jacket, does not expand evenly with the surrounding part of the cylinder, as the engine comes up to the running temperature. This produces a "lump" or "mound" on the cylinder wall, rising toward the axis of the cylinder. There the normal piston clearance is reduced. The piston "goes after" the "lump" or "mound," and takes some of it off, which tends toward truing up the cylinder while at running temperature.

After the engine has been stopped and allowed to cool, a careful inspection would show that the one-time "cold spot" is now a slight depression. This is accounted for from the fact that the "cold spot" was once a "high spot" and was "worn" off by the piston, and when cooling and contraction took place, the "cold spot" did not contract evenly with the surrounding part of the cylinder wall, making the depression.

J. E. EVERETT,
Alliance Machine Company
Alliance, Ohio.

An "Automobile" Ride— 166 Years Ago

By Christiane Fournier

"YOU won't catch cold, my fair friend? . . . And you won't be afraid?"

"Afraid? Why with you I don't think I could ever be afraid, Nicholas," she laughed gaily.

Together, the blonde lady and Nicholas Joseph Cugnot were walking across the arsenal courtyard. It was in 1769, and a bitter November wind was driving dark clouds overhead. The lady asked when Monsieur de Choiseul was expected.

"At nine o'clock," Nicholas said. And exclaimed suddenly, in the colorful speech of a soldier, "Why, 'sdeath, here's Monsieur de Gribeauval!"

De Gribeauval, Lieutenant-General of the arsenal, approached saluting Cugnot informally and bowing before blonde Madame von Omberg. Turning to Cugnot, he said:

"The machine—the fabulous machine!—is it ready? Monsieur de Choiseul will be here any minute. And I see you have a few spectators already."

At a little distance stood a crowd of fashionable visitors who had succeeded in worming their way into the arsenal to watch the start of the "Steam Cart." Fair ladies whispered among themselves and giggled. They stared at Madame von Omberg. A small boy elbowed his way through, and reaching Cugnot, said very politely: "Monsieur, my name is Gengembre. My teacher has been so kind as to give me permission to ride on the chariot. . . ."

A shout of laughter from the crowd interrupted his little speech. The Lieutenant-General, amused, said: "Bravo, Monsieur Cugnot! You are honored by that child's faith."

Cugnot said nothing as he walked toward his machine. From its conical copper boiler flashes rose toward the dull sky of All Saints Day. With an almost caressing gesture, he pointed to it, then, humbly said: "Here is the animal, sir."

"Well designed," commented Gribeauval. He examined closely the tricycle, particularly the front wheel, with its steel tire ribbed so as to increase its traction on the ground. He touched the crankshaft, which was put into motion by means of two handles, and turned to the inventor:

"Don't you think your experiment is going to be rather dangerous, Cugnot?" he asked.

Cugnot's look hardened, and in clipped, military tones he replied: "Sir, I do not fear danger. And I would like to remind you that an experiment at Brussels preceded this one."

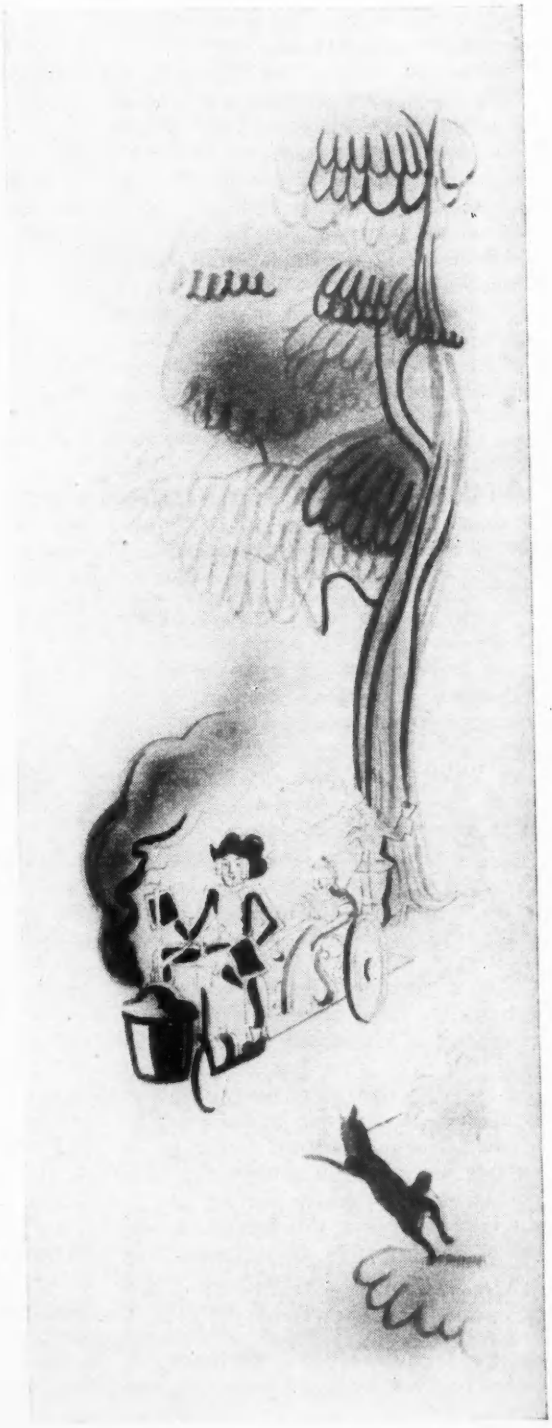
Monsieur de Choiseul's arrival cut short the conversation. A few minutes later, with a voice used to drowning the noise of galloping grenadiers and belching mortars on the battlefield, the Lieutenant-General shouted:

"We are ready—go!"

Cugnot nodded: "The machine is heated—we are ready." Turning to Madame von Omberg: "Adelaide, I beg of you—give up this foolhardy idea—don't. . . ."

The beautiful Adelaide refused. Climbing onto the chariot, she managed coquettishly to fluff out her hooped skirts. High up on the mass of copper, she looked like a brave, trusting flower. Little Gengembre climbed up onto the rear of the machine, together with another small boy.

Cugnot, his features tense with concentration, jumped to his seat, lightly despite his 44 years, and with both hands pulling



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(*Turn to page* 31, *please*)

Ricardo on Engines and Fuels

IN his Melchett lecture before the Institute of Fuels, entitled The Progress of the Internal Combustion Engine and Its Fuels, Harry Ricardo dealt at some length with characteristics desirable in fuels for high-speed Diesel engines. In Diesel engines, he said, we want to reduce the delay period, but, like everything else, this can be overdone. Imagine for a moment what would happen if there were no delay period at all. The fuel would burn immediately as it entered from the injector and the whole process of combustion would be concentrated around the nozzle of the injector. Under such extreme circumstances, what chance would the rest of the air have of finding fuel? We should get beautifully smooth running with perfect control, but very little power. We need, in fact, a delay period of sufficient duration to allow the fuel to penetrate well into the chamber before combustion starts.

With regard to fuels in general, we can say that in the majority of systems a moderately high, but not too high, cetene value is advantageous, in that it serves to shorten the delay period and thus allows of better control over the rate of burning and pressure rise. As in the case of gasoline, the cetene value of various fuels depends mainly on their source or origin, but it can be varied somewhat by varying the distillation range or by doping with such substances as amyl nitrite, ethyl nitride and certain peroxides. Generally speaking, any source which yields a bad—that is, low-octane—gasoline will yield a high-cetene Diesel oil, and vice versa. As to volatility in general, within limits, the lower the volatility the better, since too volatile a fuel is liable both to cause detonation and to give rise to gassing trouble in the fuel-injection system. At the other end of the scale, if the volatility is too low, a further delay period will be introduced, due to the greater time taken to form a gas envelope on the outside of the droplets, as has been pointed out by Boerlage and Broeze. We are still a long way off a cut and dried specification for Diesel fuels.—*The Engineer*, Oct. 25.

Progress in Silencing Aircraft

IT is stated in the annual report of the (British) Aeronautical Research Committee, recently published, that considerable progress has been made during the past year or two in silencing aircraft, especially as regards the development of a satisfactory exhaust muffler for the engines. Some mufflers have achieved an overall noise reduction of 30 decibels, thus making the exhaust noise lower than other engine noises, such as valve clatter. The problem of silencing the airplane is complicated by the fact that suppression of one noise brings another into relief, so that the final achievement may take several years to accomplish. (Credit is given to the Royal Aircraft Establishment for having evolved an automatic mixture control which results in a saving on fuel consumption of from 14 to 30 per cent, depending on the conditions of flight.) Experiments at Farnboro have shown that ice formation in the inlet tract can be prevented by the addition of a small quantity of alcohol to the gasoline. An apparatus delivering alcohol automatically when freezing begins has been devised and has passed laboratory tests satisfactorily.—*The Engineer*, Nov. 8.

Engine Factory Planned for Africa

NEGOTIATIONS are said to be in progress by the Government of South Africa, apparently with British interests, for the establishment of an automobile and airplane engine factory in the Union of South Africa. The Government is said to be ready to make certain concessions if such a factory is established.

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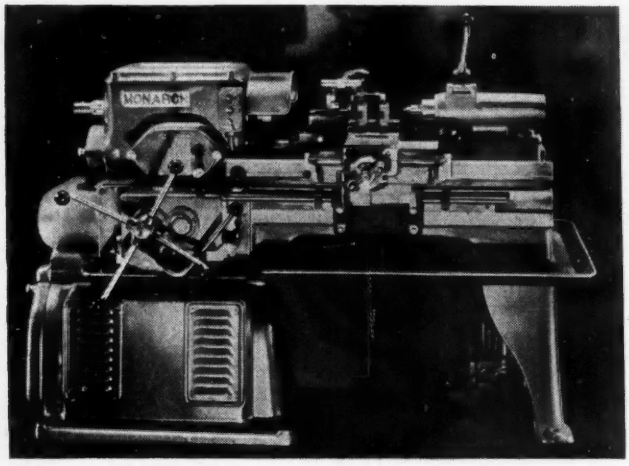


Monarch 12-in. lathe.

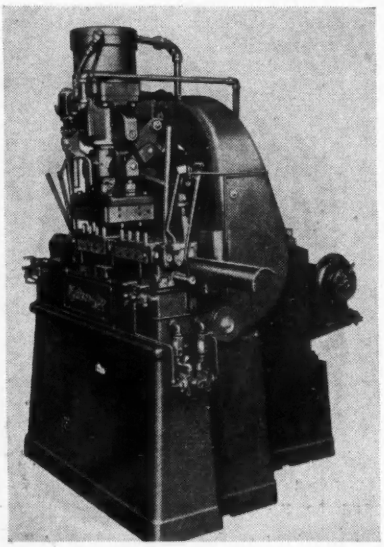
Monarch Semi-Automatic Manufacturing Lathe

The new Monarch double carriage semi-automatic manufacturing lathe is designed to handle the smaller classes of production jobs, and can be furnished with special tooling to perform a wide variety of single or multiple tooled operations. Drive is by multiple V belt with the motor mounted inside the cabinet leg. This lathe will operate at spindle speeds as high as 2000 r.p.m. in order to take advantage of the new cemented carbide cutting tools.

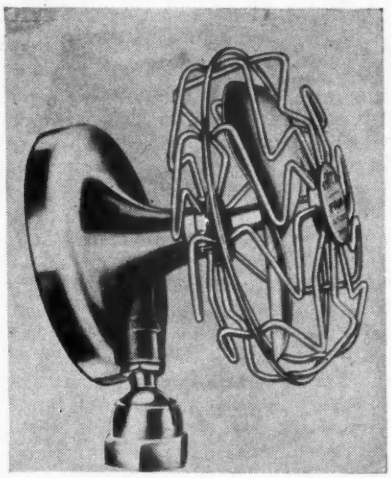
The Monarch Machine Tool Co., Sidney, Ohio, is the manufacturer of this 12-in. lathe which is known as type "T."

Die Casting Machine Air Operated

The Madison-Kipp Corporation, Madison, Wis., has added a vertical model, known as No. 7, to its line of die-casting machines. It is fully pneumatic in operation, the metal pressure chamber from which metal is supplied to the die cavity, as well as the ram for opening and closing the dies, being air-operated. As shown in the illustration, the traveling table is equipped with two sets of multiple cavity lower die halves. The ram is equipped with one mating upper die half. While castings are being made in the left-hand die, the right-hand die is open so that the operator is free to place a full set of inserts in position for the next casting.



Madison-Kipp Die Casting Machine.



Trico Fan

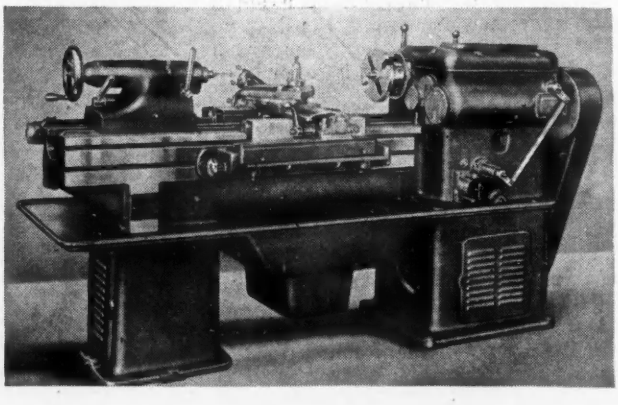
The entire upper half of the machine automatically rocks back into contact with the metal pressure chamber or gooseneck at each downward stroke of the ram, while on the up-stroke of the ram this machine assembly rocks forward and clear of the gooseneck. Only when the machine is locked in the casting position can castings be "shot."

Trico Fan Vacuum Operated

The Trico vacuum fan is designed to remove steam and frost from the windshield, and when used in connection with a car heater is said to remove snow and sleet as well. The fan can be attached to the steering column or mounted on the header board. There is only one moving part in this fan, the air turbine, which is capable of a speed of 4500 r.p.m. It is said that practically all the air is directed against the windshield, there being no dead space in the center of the air column. It is manufactured by Trico Products Corp., Buffalo, N. Y.

"Column Headstock" on P & W Lathe

The headstock construction on the new Pratt & Whitney Model C lathe is said to be unique in that the bed and



P & W Model C lathe.

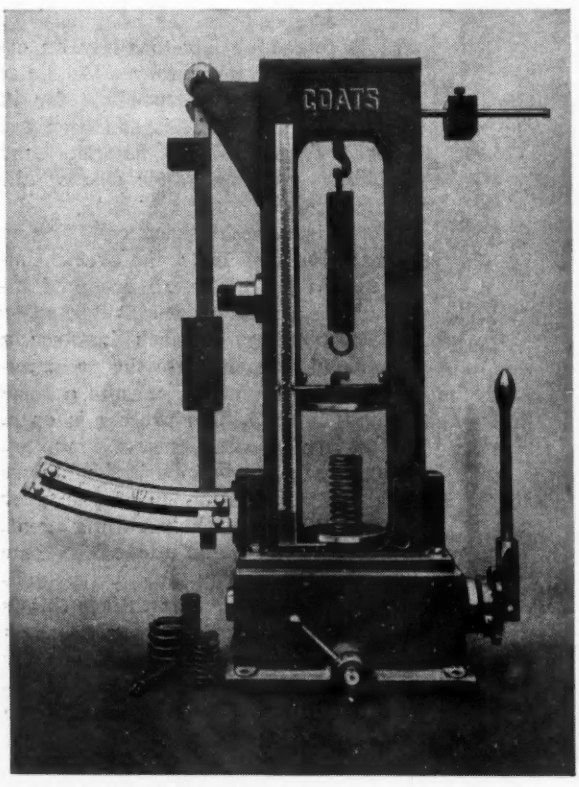
headstock have been built out to form a column construction. This provides a rigid support for the driving pulley and also produces a large surface area for an oil reservoir, an aid in keeping the lubricant cool. The headstock contains gearing which produces 18 spindle speeds ranging in geometric progression from 14 to 1000 r.p.m.

The spindle of the Model C lathe is said to represent a different design from regular lathe practice. It is heavier and is supported in three bearings. The spindle nose is of the new type D-1 and is flanged.

This recent development of the Pratt & Whitney Co., Hartford, Conn., is being supplied in a 14 in. size with a 5 hp. constant speed, 1800 r.p.m. motor, and in a 16 in. size with a 7½-hp. motor.

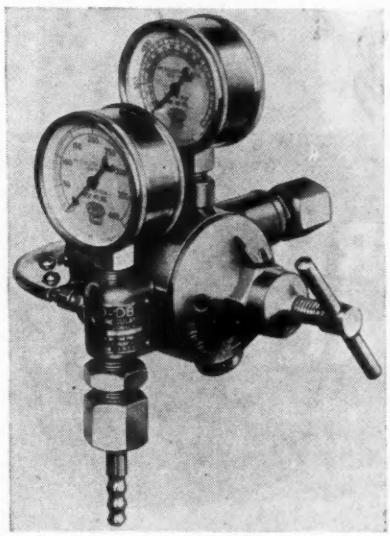
Elasticometer Spring Testing Machine

The Elasticometer spring testing machine is used in the automotive industry for checking clutch springs, valve springs, brake shoe springs, etc. The drive of this machine consists of two racks, operated by a hand lever and pinions. These racks are connected by a cross-head provided with a large bore to admit arbors when testing slender compression springs. The weigher scale of this tester consists of a single beam, from which are suspended the lower compression plate and the upper tension hook. A steel strip transmits the motion of the beam to a load-indicating pendulum hung in a knife-edge bearing. Automatic load indication, in conjunction with tolerance markers provided on the curved scale, fit the type RP testing machine, especially for mass inspection.



Elasticometer spring testing machine

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools



Airco heavy duty reduction regulator.

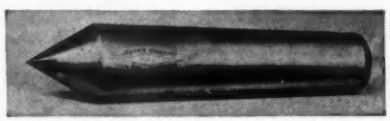
Airco Oxygen Regulator

The Airco DB style 8490 heavy duty, two-stage reduction regulator is primarily designed to deliver large volumes of oxygen at relatively high pressures, its maximum capacity being 3000 cu. ft. per hour. Constructed on the "feed-back" principle, the low pressure cavity is connected to the space in back of the first stage diaphragm by a passage through the control tube on the back of the regulator. The effect of this tube is said to be the same as if the first stage side of the regulator were equipped with an adjusting screw of its own, and this screw were turned in the same amount as the operating-pressure adjusting screw. This construction is claimed to give very close regulation.

The Air Reduction Sales Co., New York City, is marketing this device.

Tungsten Carbide Tipped Lathe Centers

Tungsten carbide tipped lathe centers, which have been made for some time on special order, are now part of the regular production of the Tungsten Carbide Tool Co., Detroit. For roughing, the new centers are said to permit much heavier cuts, as they will stand heavy side-thrust without excessive wear. The long life and relative small wear of these tips is also an aid in maintaining accuracy in production, for finishing operations.



Tungsten carbide-tipped lathe center

An "Automobile" Ride 166 Years Ago

(*Continued from page* 28)

the crankshaft, gave a sigh of relief as the machine started. Fire belched out, and the machine clattered along, jolting over the cobble-stones.

Gribeauval tried to raise his voice

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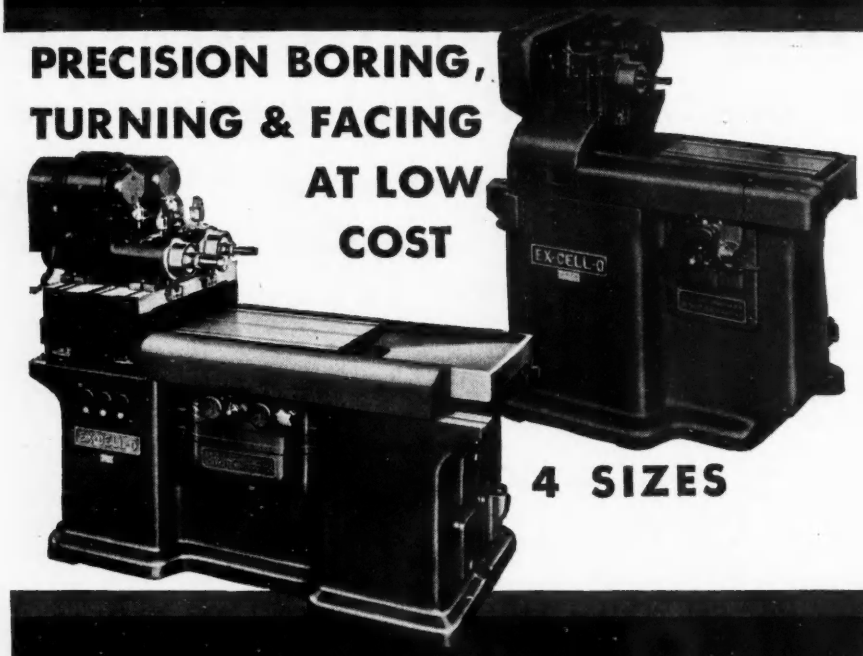

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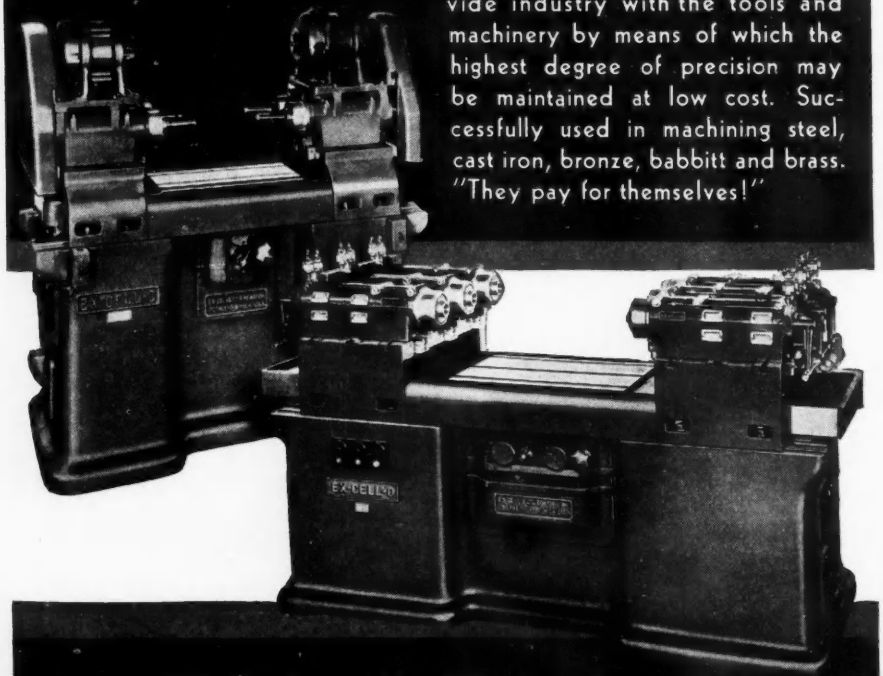

EX-CELL-O AIRCRAFT & TOOL CORPORATION DETROIT, MICHIGAN

above the hullabaloo, and shouted: "Just think! It's an infernal machine! It could do 22 miles an hour if nothing stopped it."

But as if his voice had broken a spell, the machine crashed head-on into the stone wall of the arsenal.

People rushed up—found the wall was damaged more than the machine. The passengers had escaped injury—all but the blonde Adelaide, whose white arm boasted a tiny scratch. Proudly she showed it to Monsieur de Choiseul as he helped her down. "A very small souvenir of a very great experiment!" she cried.

That was all Cugnot needed to regain faith in his invention, and to feel amply repaid for his long efforts.

The Horizons of Business

(*Continued from page* 18)

eral welfare. When Secretary Wallace, in an indiscreet moment, admitted that the Potato Control Act was absurd and unenforceable and that he as the chief administrative officer washed his hands of all certified potatoes, the commercial potato planters of Maine and all points south and west rose in high indignation, marched upon the capital and forced candid Henry to eat his words.

The Right Target

Democracy defaults in its responsibility when it flays the administrator who is forced by law to apply an obnoxious statute and ignores the naive extortioner who is responsible for it. The Potato Control Act has been red meat for professional satirists and spellbinders on the other side of the political fence.

There is something radically wrong in this. The rest of us, the overwhelming majority, see a small group of silver miners, potato growers, veterans, or tobacco planters, in each instance a very small minority, use the great authority of the state to execute a form of mass larceny. The process is open. The source of the pressure manifest. When finally we become articulate we vent our indignation upon the poor fellow who acted as the unwilling agent. It is little wonder that ours has become a government of the people, by the politicians and for minorities. Since this is the time for resolutions, we will go on record in favor of a closed season for scapegoats and a more accurately defined target for the opposition and the virtuous fourth estate.